EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AND FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE IN SELECTED HOSPITALS AT ERODE.

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A DISSERTATION SUBMITTED TO

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI,

IN PARTIAL FULLFILLMENT OF THE REQUIREMENT FOR THE

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Psalm 7:16

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ABSTRACT

Chronic kidney disease involves progressive, irreversible loss of kidney function. The kidneys have remarkable functional reserve up to 80% of the glomerular filtration rate may be last with few obvious changes in the functioning of the body.

The two main causes of chronic kidney disease are diabetes mellitus and high blood pressure which are responsible for up to two-third of the cases. Diabetes Mellitus happens when blood sugar is too high, causing damage to many organs in the body, including the kidneys. It can contribute to RLS (restless legs syndrome), it is the uncomfortable sensation and sometimes intense feeling in the leg muscles, because of this patients are more likely to have problems in carrying out their daily activities. Stretching exercises helps to reduce the severity of restless legs syndrome as well as fatigue.

The present study was conducted to evaluate the effectiveness of stretching exercises on restless legs syndrome and fatigue among patients with chronic renal failure in selected hospitals at Erode.

An evaluative approach was used for this study. The design used for the study was Quasi experimental non equivalent control group pretest and posttest design. The conceptual frame work was based on modified **Wiedenbach's helping art of clinical nursing theory (1964).** Sample size was 60 out of which 30 were in experimental group and 30 were in control group. The samples were selected by non-probability purposive sampling technique. The data collection period was 6 weeks. Data pertaining to the demographic variables was collected by interview then pretest was conducted to the participants by using International Restless Legs Syndrome Study Group Rating Scale and fatigue assessment scale by structured interview schedule for both groups. From first day onwards stretching exercise intervention was given to the experimental group individually for 30 minutes, one hour before and one

hour after hemodialysis continued for 15 days. On the 15th day post test was conducted for the experimental and control group by using the same scales.

The data gathered were analyzed using descriptive and inferential statistics. The Independent 't' value of restless legs syndrome was 23.8 which was significant at $P < 0.05$ level. This showed that there is a significant reduction in the level of restless legs syndrome between experimental group and control group. The Independent 't' value for fatigue was 20.4 which was significant at $P< 0.05$ level. This showed that there is a significant reduction in the level of fatigue between experimental group and control group.

The study findings revealed that there was no association between the level of restless legs syndrome among patients with chronic renal failure and their demographic variables in experimental group except for education (χ^2=11.43) in experimental group at $P<0.05$ level of significance and there was no significant association between the level of fatigue among patients with chronic renal failure and their demographic variables in experimental group except for education (χ^2= 9.281), duration of hemodialysis treatment (χ^2= 11.62) in experimental group at $P<0.05$ level of significance.

The results of the study concluded that stretching exercises are effective in reducing restless legs syndrome and fatigue among patients with chronic renal failure.

CHAPTER – I

INTRODUCTION

"The imagination is a muscle. If it is not exercised, it atrophies''

Neil Gaiman.,(2001)

BACKGROUND OF THE STUDY

Health is a complete fitness of the body, soundness of mind, and the wholesomeness of emotion which makes possible the highest quality of effective living and service. It illustrates how body, mind and soulful awareness award with a greater appreciation of all physical treatments, mental techniques, and spiritual practices.

Frederick Kilander., (2013)

Health is a state of quality of physical, emotional, and mental well being which enables one to live effectively and enjoyably.

Carl Anderson's., (2010)

Wellness, "A conscious, self-directed and evolving process of achieving full potential."

Bill Hettler, National Wellness Institute.,(2018)

Wellness, "An integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable. It requires that the individual maintain a continuum of balance and purposeful direction within the environment where it is functioning, Wellness is a direction in progress toward an ever-higher potential of functioning".

Halbert Dunn., (2012)

Illness is the impairment of normal physiological function affecting a part or whole of human being.

Anderson B.,(2010)

Disease may be caused by factors originally from an external source, such as infectious disease, or it may be caused by internal dysfunctions, such as autoimmune diseases. Diseases usually affect people not only physically, but also emotionally, as contracting and living with many diseases can alter one's perspective on life, and their personality.

John D.,(2010)

A disease is a particular abnormal, pathological condition that affects part or all of an organism. It often construed as a medical condition associated with specific signs and symptoms.

WHO., (2013)

A growing body of scientific evidence indicates that virtually every illness which affects the body has neuropsychoenergetic roots, and begins as a pre-illness in the human energy system.

Carol Ritberger., (2010)

A chronic disease can be defined as a disease that has a prolonged course that does not resolve spontaneously, and for which a complete cure is rarely achieved. Chronic diseases account for the overwhelming majority of deaths and disability. Among the chronic diseases few of them are Alzheimer's disease, arthritis, asthma, cardiovascular disease, diabetes, heart disease, stroke and chronic renal failure(CRF).

McKenna, et al.,(2010)

Renal failure occurs due to damage to the functions of the kidneys that lead to failure of the normal filtration process. This could be sudden or rapid in onset in case of acute renal injury or damage or acute renal failure. It may also occur due to long term damage to the kidney functions leading to chronic renal failure.

Cashin-Garbutt.,(2014)

Renal failure also known as renal insufficiency, is a condition where kidneys lose the ability to remove waste and balance fluids from blood. Diabetes and high blood pressure are the most common cause of renal failure. Two distinct types of renal failure acute kidney failure and chronic kidney failure.

Journal of renal medicine.,(2017)

Acute renal failure is traditionally defined as a rapid fall in the rate of glomerular filtration, which manifests clinically as an abrupt and sustained increase in the serum levels of urea and creatinine with an associated disruption of salt and water homeostasis.

R.Hilton.,(2011)

Chronic renal failure (CRF) or chronic kidney disease (CKD), is a slow and progressive decline of kidney function. It's usually a result of a complication from another serious medical condition.

Unlike acute renal failure, which happens quickly and suddenly, chronic renal failure happens gradually over a period of weeks, months, or years as the kidneys slowly stop working, leading to end-stage renal disease(ESRD).

Louise Vitou, MD.,(2017)

The most common form of kidney disease is chronic kidney disease. Chronic kidney disease is a long-term condition that doesn't improve over time. It's commonly caused by high blood pressure and Diabetes.

Carissa stephens.,(2017)

Chronic kidney disease involves progressive, irreversible destruction of the nephrons in both kidneys. The last stage of kidney failure (ESRD) occurs when the glomerular filtration rate is less than 15ml per minute.

Lewis Heitkemper.,(2007)

The term "chronic kidney disease "means CKD is defined as the presence of kidney damage, manifested by abnormal albumin excretion or decreased kidney function, quantified by measured or estimated glomerular filtration rate (GFR), that persists for more than 3 months.

Robert Thomas.,(2008)

Modifiable risk factors for kidney failure are diabetes mellitus, high blood pressure, scarring from infections or malformed lower urinary system, overuse of painkillers, drug abuse, inflammation and non modifiable risk factors include, family history of kidney disease, premature birth, older age, trauma and accident, certain diseases

Adeera levin.,(2011)

The most common causes for CRF are diabetes and high blood pressure (hypertension). Acute Kidney injury increases the risk for chronic kidney failure.

Stanley J.Swierzewski. M.D.,(2015)

Contemporary medicine classifies chronic kidney disease into five distinct stages. The first stage is the mildest and generally causes few

symptoms. The fifth stage is known as established chronic kidney disease. The later stages of CKD offer the lowest chance of survival if left untreated.

DannyBega.,(2015)

Treatment for chronic kidney disease focuses on slowing the progression of the kidney damage, usually by controlling the underlying cause. Chronic kidney disease can progress to end-stage kidney failure, which is fatal without artificial filtering (dialysis) or a kidney transplant.

Rosenberg M.,(2016)

The kidneys also make harmonious and balance the minerals in the blood. When the kidneys stop working, body will develop wastes that affect the blood, bones, nerves and skin. In addition to fatigue, loss of appetite, leg cramps, itching, sleep disturbance, restless legs, week joint problems and stress, depression will occur psychologically. Some of the common complications of CKD include anemia, bone disease, heart disease, high potassium, high calcium and fluid buildup.

American Kidney Foundation.,(2016)

People with diabetes or hypertension should control their conditions to help prevent End Stage Renal Disease (ESRD). Both conditions benefit from drug therapy using angiotensin converting enzyme inhibitors (ACE inhibitors) or angiotensin receptor blockers (ARBs).

Some vaccines can help prevent serious complications of ESRD. According to the Centers for Disease Control and Prevention, the hepatitis B and pneumococcal polysaccharide (PPSV23) vaccines can lead to positive outcomes, especially before and during dialysis treatments

Christine DiMaria.,(2017)

Restless legs syndrome (RLS), also called Willis-Ekbom disease, causes unpleasant or uncomfortable sensations in the legs and an irresistible urge to move them. It is a neurological movement disorder that affects a large number of people. The prevalence of restless legs syndrome in the general population ranges from 5 to 15%.

Samar O.Wali.,(2016)

It is estimated that up to 7-10 percent of the U.S. population may have restless legs syndrome. Restless legs syndrome occurs in both men and women, although women are more likely to have it than men. It may begin at any age. Many individuals who are severely affected are middle-aged or older, and the symptoms typically become more frequent and last longer with age.

Kim E Innes.,(2011)

The cause is unknown, but people with a family history of restless legs syndrome make up approximately 50 % of cases, and people with low iron levels or anemia, chronic diseases such as kidney failure, diabetes, Parkinson's disease, and peripheral neuropathy, some pregnant women in their last trimester and people taking certain medications such as anti-nausea, anti-seizure, and anti-psychotic drugs, and some cold allergy medications appear to be more likely to suffer from restless legs syndrome.

Dominic Rowe.,(2017)

The severity of restless legs syndrome symptoms ranges from mild to intolerable. Symptoms can come and go and severity can also vary. The symptoms are generally worse in the evening and at night. For some people, symptoms may cause severe nightly sleep disruption that can significantly impair their quality of life.

Minesh Khatri, MD.,(2017)

More than 80 percent of patients with restless legs syndrome manifest periodic leg movements during sleep and polysomnographic monitoring demonstrates limb movements at sleep onset. Polysomnographic reports typically detail periodic leg movements during sleep, a periodic limb movement index (PLMI), and a periodic limb movement arousal index (PLMAI).

Electromyography (EMG) monitoring of the tibialis anterior muscle shows repetitive myoclonic contractions lasting from 0.5 to 10 seconds. The interval between jerks is typically 20 to 40 seconds, with a maximum variation of 5 to 90 seconds. The contractions can occur throughout nocturnal sleep but most often happen during one part of it.

A recent study reported that patients with periodic leg movements during sleep exhibit a circadian rhythm that is maximal in the late evening or early night, similar to patients with restless legs syndrome.

Christian Guilleminault.,(2012)

Fatigue (also called exhaustion, lethargy, languidness, languor, lassitude and listlessness) is a state of awareness describing arrange of afflictions, usually associated with physical and mental illness, through varying from general state of lethargy to a specific work –induced.

Emilia.,(2011)

Fatigue (either physical, mental or both) is a symptom that may be difficult for the patient to describe and words like lethargic, exhausted and tired may be used.

Benjaminwedro., (2014)

The incidence of fatigue in haemodialysis patients ranges from 60% 97% while the level of fatigue of haemodialysis patients is one of the highest

among chronic patients including cancer patients receiving chemotherapy, depressive patients and patients with Systemic Lupus Erythematosus.

Sofia Zyga.,(2015)

A recent investigation using visual analog scale reported that 81.5% of haemodialysis patients experienced fatigue. A similarly high prevalence of fatigue in the haemodialysis population (77.9%) is reported.

Micol Artom.,(2014)

There are numerous causes of fatigue symptoms. Examples of some treatable causes of fatigue include anemia, diabetes, thyroid disease, heart disease, COPD and sleep disorder.

Benjamin Wedro.,(2014)

Fatigue is one of the most frequently reported symptoms in renal disease patients. Compared with the general population, dialysis patients report far higher fatigue levels.

Micol Artom.,(2014)

Stretching is a form of physical exercise in which a specific muscle or tendon (or muscle group) is deliberately flexed or stretched in order to improve the muscle's felt elasticity and achieve comfortable muscle tone. The result is a feeling of increased muscle control, flexibility, and range of motion.

Herbert RD.,(2011)

Stretching prepares the body for exercise, increases the range of motion and prevents muscle imbalances that can lead to serious injury. The American council on exercise advises performing a light five minute cardiovascular warm-up before stretching.

According to research published in the Journal of Alternative and Complementary Medicine, women with restless legs syndrome who practiced yoga reduced their symptoms and experienced less stress, elevated mood, and better sleep habits.

Melinda Smith.,(2018)

Performing stretching exercises before dialysis, performing mild exercise such as riding a stationary bicycle during dialysis prevent cramps. Local heat (including showers or baths) or ice, massage, walking or leg jiggling followed by leg elevation, are other methods reported to help relieve muscle cramps.

Holley Sheon, (2012)

Exercises are very important element in the overall health of people at any age. Stretching exercises are the best measure to reduce or prevent cramps from occurring cramps during haemodialysis among chronic renal failure patients cramps during haemodialysis among chronic renal failure patients.

Mohamed et.al.,(2007)

Practice nurses have an invaluable role in recognizing undetected restless legs syndrome, in reassuring and educating patients and their families about the condition, and checking that it is not secondary to other conditions. With their skills in listening to patients and liaising with their medical colleagues, they can help to alleviate the symptoms of restless legs syndrome, improving patients' daytime functioning.

Thomas S, MacMahon D.,(2006)

NEED FOR THE STUDY

"Prevention is better than cure"

According to WHO(2002), Global burden of disease (GBD) project, diseases of kidney and urinary tract contribute to the global burden of diseases, with approximately 850,000 deaths every year and 15,010,167 disability adjusted life years. Chronic kidney disease is the 12^{th} leading cause of death and 17^{th} cause of disability.

WHO., (2008)

According to the 2010 Global Burden of Disease study, chronic kidney disease was ranked 27^{th} in the list of causes of total number of deaths worldwide in 1990, but rose to 18^{th} in 2010. This degree of movement up the list was second only to that for HIV and AIDs. Over 2 million people worldwide currently receive treatment with dialysis or a kidney transplant to stay alive, yet this number may only represent 10% of people who actually need treatment to live.

Remuzzi G.,(2011)

Of the 2 million people who receive treatment for kidney failure, the majority are treated in only five countries – the United States, Japan, Germany, Brazil, and Italy. These five countries represent only 12% of the world population. Only 20% are treated in about 100 developing countries that make up over 50% of the world population. More than 80% of all patients who receive treatment for kidney failure are in affluent countries with universal access to health care and large elderly populations.

Garcia-Garcia G.,(2013)

In USA, in 2002, new patients per year were 80,000 which had increased to 30 million by 2010.

J.stiffiner.,(2010)

In 2014, 118,000 people in the United States started treatment for ESRD, and 662,000 were living on chronic dialysis or with a kidney transplant. Men are 64% more likely than women to develop ESRD. In US adults aged 18 years or older, the main reported causes of new cases of ESRD are diabetes and high blood pressure.

Hemmelgarn BR.,(2012)

In Australia, it is estimated 1.7 million (10%) Australian adults aged 18 years and over had biomedical signs of chronic Kidney disease (CKD) in 2011-12, based on measured data from the Australian Bureau of statistics (ABS) 2011-12. The Vast majority of these (97%) showed early signs of the disease (stages 1-3).

CKD remains a highly under-diagnosed condition- only 10% of the survey respondents who showed biomedical signs of CKD also self-reported that they had the condition.

Australian institute of health and welfare., (2017)

In UK, the new CKD prevalence model, estimated that in 2011 there were 2.6 million people (95% CI 2.3 million – 3.0 million) aged 16 years and older living with CKD stage 3-5 (diagnosed and undiagnosed).

CKD stage 3-5 prevalence is higher in women than in men, 7.4% versus 4.7%. There is a clear association between increasing age and higher CKD prevalence; with 1.9% of people aged 64 and under having CKD stage III-V, 13.5% of people aged 65-74 and 32.7% of people aged 75 and over.

Emma Barron.,(2012)

In china, on the basis of a study in 2013 that showed there were 113 Million persons with diabetes in china, the estimated number of patients with chronic kidney disease related to diabetes in China was 24.3 million, of whom 60.5% have preserved kidney function with slightly increased albuminuria.

Roseanne O.Yeung, M.D.,(2016)

In Germany, approximately 2.3% of the adult German population, aged 18 to 79 years, has an eGFR of <60 mL/min/1.73m^2. In the same group, the estimated overall prevalence for elevated urinary albumin excretion is 11.5%, while that for having either a reduced eGFR or albuminuria is 12.7%.

German Federal Ministry of science.,(2016)

In Taiwan, a study revealed that the prevalence of ESRD increased from 2111 to 2926 per million of the population, while the incidence of ESRD increased from 376 to 426 per million populations. There was a trend where the subgroup aged more than 75 years was increasing, but the incidence of ESRD in other age groups (aged between 45-64 and 20-44) had stabilized. In addition, the incidence of males was increasing faster than females. Finally, the proportion of diabetes was up to 47.9% in the incident patients of ESRD

Yen Chung Lin(2012)

In India, it has been recently estimated that the age-adjusted incidence rate of ESRD to be 229 per million population (pmp) and > 100,000 new patients enter renal replacement programs annually.

Ajay K Singh.,(2013)

In India, the highest prevalence of CKD was observed in Vishakhapatnam (46.8%) followed by Kanpur (41.7%) and Delhi (41%). The lowest prevalence were in Mysore (4.2%) and Bangalore (4%).

Durgesh Nandhan Jha.,(2013)

In India the prevalence was estimated that 53% of all deaths and 44% disability adjusted life in the year 2005, changes in life style and urbanization resulted in obesity, hypertension and diabetes which is associated with increased risk of chronic kidney disease.

Manisha. Jhamb.et al.,(2008)

In Delhi, the study done in Delhi showed the prevalence of CKD is 0.785% or 7852/million adult population. They had 31.2% hypertensive and 7.3% diabetics in the screened population.

Singh.et.al.,(2014)

In Jharkhand the diabetes and hypertension today account for 40-60% cases of CKD. As per recent Indian Council of Medical research data, prevalence of diabetes in Indian adult population has risen to 7.1% (varying from 5.8% in Jharkhand and 13.5% in Chandigarh) and in urban population (over the age of 40 years) the prevalence is as high as 28%.

PP.Varma.,(2015)

In Andhra Pradesh, in Uddanam area consisting of Ichhapuram and Kaviti mandals in Srikakulam district to find out the cause of the high rate of chronic kidney diseases (CKD) in the region. It has been found that about 60 percent of the people of the area are suffering from kidney-related problems. As many as 116 villages in 27 mandals in the area have high incidence of kidney related problems.

Praveen Gadde.,(2017)

In Tamilnadu**,** the prevalence of proteinuria with renal failure in adult rural population was 0.47 per cent in overall population.

WHO.,(2010)

In Tamilnadu, it has one of the highest incidences of diabetes in India, and up to 30 percent of diabetics develop chronic kidney diseases.

Vivekanand Jha.,(2018)

In Chennai, Conducted a study to assess the prevalence of haemodialysis patients with malnutrition. Most indicators, especially identifying high risk patients with malnutrition. Majority of patients (35 males and 10 females) 1182 patients had been undergoing haemodialysis for a period of 2-3 years. Assessing the prevalence population, the score was 17.3±3.2 in women and 18.2±2.6 in men.

Mani.M.K.,(2009)

In Chennai, to determine the prevalence of end stage renal disease and undergoing haemodialysis patients between the period of 2008-2009. A total of 66 patients (46 males(69.6%) with the mean age of 49.52±14.3 years and 20 females (30.3%) with the mean age of 46.3±16.4 years.

Jeejeebhoy.K.N.,(2009)

In Coimbatore, (south) the study was conducted to determine the prevalence of haemodialysis. A study was conducted to observe the frequency and various risk factors associated with restless legs syndrome in haemodialysis patients and to evaluate various factors associated with restless legs syndrome. Total number of patients were 137 who were on regular haemodialysis for more than 3 months at either dialysis centre were approached at the time of the study, and other 100 patients participated in this study, 55 were male (55%) and female 45 (45%), age ranged from 10 to 70 years. (Mean = 45.06). In our study restless legs syndrome was present in 32 patients (prevalence 32%), including 18 males and 14 females. 16 (50%) of the

32 patients with restless legs syndrome had mild, 12 (37.5%) had moderate and 4 patients had severe restless legs syndrome (12.5%).

Rashid Ahmed Shaikh.,(2013)

A study was aimed to find out the effectiveness of muscle stretching exercises such as Quad stretch, Hamstring, inner thigh stretch among patients with chronic renal failure Data was collected from 86 chronic kidney disease patients undergoing haemodialysis. The restless legs syndrome rating scale was used measure the magnitude of the restless legs syndrome. The result of the study shows that in baseline the restless legs syndrome mean score was 0.59 and after a week of muscle stretching exercise program implementation the mean score was reduced to 0.34. Intervention was found to be effective in reduction of restless legs syndrome symptoms of haemodialysis patients significantly ($p \leq 0.05$), whereas there was no significant change found in the control group

Nahid Shahgholian.,(2016)

A study was conducted to assess the effectiveness of Leg stretch exercises on fatigue among patients undergoing haemodialysis. A total of 60 samples were selected by using non probability convenience sampling technique. The findings of the study revealed that effectiveness of leg stretch exercises on fatigue among patients undergoing haemodialysis, in experimental group, during pretest, 16(53%) had mild fatigue whereas in posttest, 5(17%) had mild fatigue. In pretest, 17(57%) had moderate fatigue whereas in posttest, 12(40%) had moderate fatigue. In pretest, 8(26%) had severe fatigue whereas in posttest, 2(7%) had severe fatigue. In experimental group the posttest mean is 27.5 with standard deviation of 9.74 where as in control group the mean is 35.4 with standard deviation of15.3. The calculated value is 2.20 is greater than

the tabulated value 1.69. The study concludes that the Leg stretching exercises are effective in reducing the fatigue levels.

Veeram Reddy Thejaswi.,(2016)

According to studies it is proved that exercise can improve the muscle strength which in turn will improve cardiovascular function and quality of life. As there are lots of limitation placed on physical inability in renal patients stretching exercises are best suited to improve muscular strength which in turn improves the level of muscle atrophy and fatigue in 95.7%of dialysis patients.

Shiji Mathew.,(2014)

The investigator observed during clinical experience in Nallaswamy Hospital, Erode. The patients with chronic renal failure undergoing haemodialysis such as restless legs syndrome, fatigue, muscle cramps, swelling in the face and legs. Hence the researcher felt to help the patients with chronic renal failure to perform stretching exercises, so that the level of severity of restless legs syndrome and fatigue will be minimized.

STATEMENT OF THE PROBLEM

A study to evaluate the effectiveness of stretching exercises on restless legs syndrome and fatigue among patients with chronic renal failure in selected hospitals at Erode.

OBJECTIVES

1) To assess the pretest and posttest level of severity of restless legs syndrome and fatigue among patients with chronic renal failure in experimental and control group.

2) To compare the pretest and posttest level of severity of restless legs syndrome among patients with chronic renal failure in experimental group.

3) To compare the pretest and posttest level of fatigue among patients with chronic renal failure in experimental group.

4) To evaluate the effectiveness of stretching exercises on severity of restless legs syndrome among patients with chronic renal failure between experimental and control group.

5) To evaluate the effectiveness of stretching exercises on fatigue among patients with chronic renal failure between experimental and control group.

6) To find the association between the posttest level of restless legs syndrome among patients with chronic renal failure and their selected demographic variables in experimental group.

7) To find the association between the posttest level of fatigue among patients with chronic renal failure and their selected demographic variables in experimental group.

OPERATIONAL DEFINITIONS

EFFECTIVENESS

Effectiveness refers to producing an Intended results.

Soanes c., (2001)

In this study, effectiveness refers to the extent to which stretching exercises helps to reduce the level of severity of restless legs syndrome and fatigue among patients with chronic renal failure in experimental group, which

is determined by significant difference between the pretest and posttest scores by using statistical measurements and its scores.

STRETCHING EXERCISES

Stretching is a form of physical exercise in whicha specific muscle or tendon (or muscle group) is flexed or stretched in order to improve the muscle's elasticity and achieve comfortable muscle tone.

LaRocheD,Connolly J(2006)

In this study, it refers to the muscle stretching exercises intervention of the hip and lower extremities were given, twice a day (one hour before and one hour after haemodialysis) for 15 days to the patients with chronic renal failure.

The steps of stretching exercises for 30 minutes are as follow,

STEP 1: The initial warm up exercises for 5minutes. It consists of a gradual increase in intensity in physical activity, joint mobility exercise, and stretching; it is a preparatory exercises done to warm up the muscles.

STEP 2: It includes seven stretching exercises namely hip rotation to the sides for 3 minutes, quadriceps stretch for 3 minutes, knee-to-stretch for 3 minutes, hamstring stretch for 3 minutes, straight leg raise for 3 minutes, gluteal stretch for 3 minutes, side lying leg lift for 2 minutes, and the duration of this procedure is 20 minutes.

STEP 3: The relaxed exercises for 5 minutes. It refers to the variety of methods and manipulations used to reduce stress, muscle tension, and anxiety in the body.

RESTLESS LEGS SYNDROME:

Restless legs syndrome (restless legs syndrome), also called Willis-Ekbom Disease, causes unpleasant or uncomfortable sensations in the legs and an irresistible urge to move them.

William Blahd, MD(2003)

In this study, restless legs syndrome refers to symptoms that occurs frequently and their lives experiencing functional impairments and distress, which is measured by using the Walter's International Restless legs syndrome study group scale and its scores.

FATIGUE:

Fatigue (also called exhaustion, lethargy, languidness, languor, lassitude and listlessness) is a state of awareness describing arrange of afflictions, usually associated with physical and mental illness, through varying from general state of lethargy to a specific work –induced.

Emilia.,(2011)

In this study, fatigue refers to the extreme tiredness felt among chronic renal failure patients and the level of fatigue which is measured by fatigue assessment scale **(Helen.J. Michielsen et.al.,2002)** and its scores.

PATIENTS WITH CHRONIC RENAL FAILURE:

Patients with chronic renal failure, is an individual who is having a progressive, irreversible deterioration in renal function in which the body fails to maintain metabolic, fluid and electrolyte balance, resulting in uremia and azotemia.

Lewis Heitkemper.,(2007)

In this study, it refers to the patients with chronic renal failure who are undergoing haemodialysis within the age group of 40-65 years admitted in Inpatient Unit, and with a minimum stay of 16 days. The patients were screened for the diagnosis of restless legs syndrome using International restless legs syndrome study group rating scale and its scores.

HYPOTHESES

H_1: The mean posttest level of severity of restless legs syndrome scores is significantly lower than the mean pretest level of severity of restless legs syndrome scores among patients with chronic renal failure in experimental group.

H_2: The mean posttest level of fatigue scores is significantly lower than the mean pretest level of fatigue scores in experimental group.

H_3: The mean posttest level of severity of restless legs syndrome scores in experimental group is significantly lower than the mean posttest level of severity of restless legs syndrome scores in control group.

H_4: The mean posttest level of fatigue scores in experimental group is significantly lower than the mean posttest level of fatigue scores in control group.

H_5: There will be significant association between the posttest level of severity of restless legs syndrome scores among patients with chronic renal failure and their selected demographic variables in experimental group.

H_6: There will be significant association between the posttest level of fatigue scores among patients with chronic renal failure and their selected demographic variables in experimental group.

ASSUMPTIONS

- Chronic renal failure patients may have anemia due to inadequate production of RBC's, which leads to restless legs syndrome and fatigue.
- Exercises may help to reduce the level of severity of restless legs syndrome and fatigue among patients with chronic renal failure.
- Nurses have a major role to reduce restless legs syndrome and fatigue among patients with chronic renal failure.

DELIMITATIONS

The study was delimited to,

- Data collection period was 6 weeks.
- Sample size was limited to 60.

PROJECTED OUTCOME:

Stretching exercises reduces the severity of restless legs syndrome and fatigue among chronic renal failure patients. It helps to minimize the hospital stay by promoting the activities of daily living and improve their quality of life.

CONCEPTUAL FRAMEWORK

Conceptual framework helps to express about ideas in a more reality. Conceptual framework for this study was direction from Wiedenbach's helping art of clinical nursing theory (1964).

According to Ernestine Wiedenbach's nursing is nurturing and caring for someone in a motherly fashion. Nursing is a helping service that is rendered with compassion, skill and understanding to those in need for care, counsel and confidence in the area of health. The practice of nursing comprises a wide variety of services each directed towards the attainment of one of its three components.

Step 1: Identification of a need for help.

Step 2: Ministration the help needed

Step 3: Validation that the need for help was met

Central purpose

According to theorist the nurses central purpose defines the quality of health nurses desires to effect or sustain in patients and specifies what recognizes to be nurse special responsibility in caring for the patient. In this study, the central purpose is to reduce the level of restless legs syndrome and fatigue among the patients with chronic renal failure.

Step 1: Identification of a need for help.

According to theorist within the identification component there are four distinct steps. First, the nurse observes the patient, looking for an inconsistency between the expected behavior of the patient and the apparent behavior. Second attempts to clarify what the inconsistency means. Third, determines the cause of inconsistency finally evaluated with patient that help is needed.

In this study, the demographics variables are age, sex, marital status educational status, occupation, religion, family monthly income, duration of illness, duration of treatment on haemodialysis,. The pretest assessment of level of severity of restless legs syndrome and fatigue among patients with chronic renal failure by using questionnaire method.

Step 2: Ministration the help needed

According to the theorist in ministry of the patient the nurse give advice or information make referral apply a comfort measure, or carry out therapeutic procedure. The nurse will need to identify the cause and if necessary make an adjustment in the plan of action.

Ministration of help needed, it has two components.

a) Prescription
b) Realities

Prescription:

According to the theorist a prescription is a directive activity. It specifies both the nature of the action that will most likely lead to fulfillment of the nurses central purpose and the thinking process that determines it.

In this study the prescription, is plan of care to achieve the purpose which includes administration of stretching exercises to reduce the restless legs syndrome and fatigue among the patients with chronic renal failure. The duration of stretching exercise is 30 minutes. It is continued for 15 days.

Realities:

According to the theorist the realities of the situation in which the nurse is to provide nursing care. Realities of the situation in which the nurse is to provide the nursing care. Realities consist of all factors physical, psychological

emotional and spiritual that is at play in a situation in which nursing action occur at any given movement.

I) Agent

According to the theorist the agent is the practicing nurse or delegate is characterized by the personal attributes, capacities, and most importantly commitment and competencies in nursing.

In this study the investigator is the agent.

II) Recipient

According to theorist, the recipient is the patient is characterized by personal attributes, problems, capacities, aspirations and most important the ability to cope with the concerns or problems being experienced.

In this study, the recipients are the patient with chronic renal failure.

III) Goal

According to the theorist the goal is the desired outcome the nurse wishes to achieve. The goal is the end result to be attained by the nursing action.

In this study it refers to reduce the level of restless legs syndrome and fatigue among the patients with chronic renal failure.

IV) Means

According to the theorist, the means comprise the activities and devices through which the practitioner is enabled to attain the goal. The means include skill, techniques, procedures and devices that may be used to facilitate nursing practice.

In this study, it refers to administration of stretching exercise, by using demonstration method, individually for 30 minutes twice a day continued for 15 days.

V) Framework

According to the theorist, the framework consists of human environmental, professional and organizational facilities that not only make up the context within which nursing is practiced but also constitute its currently existing limits. In this study, it refers to the Nallaswamy kidney center at erode

Step III: Validation that need for help was met

According to the theorist, the third component is validation. After the help has been ministered, the nurses validated that the action were indeed helpful. Evidence must come from the patient that the purpose of the nursing action has fulfilled.

In this study, the validation need for help was met by means of posttest assessment of level of restless legs syndrome and fatigue among the patients with chronic renal failure, by using the Walter's international restless legs syndrome study group rating scale and fatigue assessment scale.

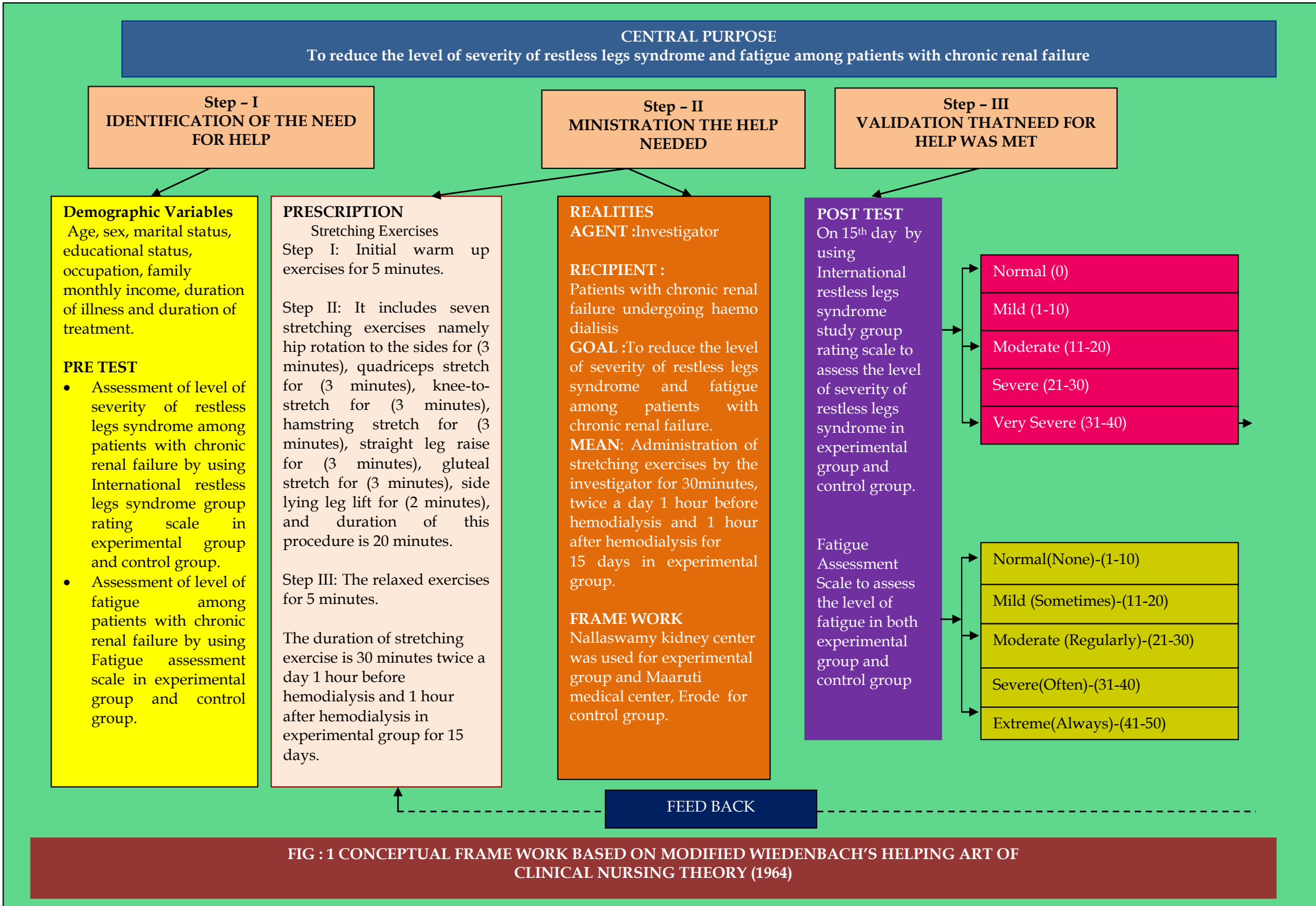


FIG : 1 CONCEPTUAL FRAME WORK BASED ON MODIFIED WIEDENBACH'S HELPING ART OF CLINICAL NURSING THEORY (1964)

CHAPTER –II

REVIEW OF LITERATURE

This chapter deals with the related review of literature. The literatures are classified under the following headings.

PART – I

Overview of

a **)** Chronic renal failure

b) Restless legs syndrome among chronic renal failure patients

c) Fatigue among chronic renal failure patients

d) Stretching exercises

PART – II

Section A **:** Studies related to incidence and prevalence of chronic renal failure .

Section B **:** Studies related to restless legs syndrome among patients with chronic renal failure.

Section C **:** Studies related to fatigue among patients with chronic renal failure.

Section D **:** Studies related to effectiveness of stretching exercises on restless legs syndrome among patients with chronic renal failure.

Section E **:** Studies related to effectiveness of stretching exercises on fatigue among patients with chronic renal failure

PART – I

A) OVERVIEW OF CHRNIC RENAL FAILURE

INTRODUCTION:

The loss of renal function may be due to previous episodes of acute renal failure with subsequent long term kidney damage or may be due to diseases which cause progressive deterioration of the kidney such as primary kidney diseases glomerulonephritis or secondary disorders such as diabetes, hypertension, or auto-immune disorders.

The loss of kidney function may be progressive but with therapy of the underlying cause the damage can be halted and in some cases the kidney function may actually improve.

Raymond K. Hsu et. al., 2016

DEFINITION:

The term "chronic kidney disease means lasting damage to the kidneys that can get worse over time. If the damage is very bad, kidneys may stop working. This is called kidney failure, or end-stage renal disease (ESRD).

Joseph A.Vassalotti MD.,(2016)

Chronic Kidney Disease is defined as the presence of kidney damage or glomerular filtration rate (GFR) of <60 mL/min/1.73m^2 for less than 3 months. CKD is further classified into Stages I–V according to the estimated GFR (eGFR).

P Delanaye.,(2016)

INCIDENCE:

Chronic kidney disease affected about 323 million people globally in 2015. In 2015 it resulted in 1.2 million deaths, up from 409,000 in 1990. The causes that contribute to the greatest number of deaths are high blood pressure at 550,000, followed by diabetes at 418,000, and glomerulonephritis at 238,000.

Remuzzi G.,(2016)

ETIOLOGY FOR CHRONIC RENAL FAILURE:

Diabetes and high blood pressure are the most common causes of chronic kidney disease (CKD).

Diabetes:

Too much glucose also called sugars in the blood damages the kidney's to filter. Over time, the kidneys can become so damaged that they no longer do a good job filtering wastes and extra fluid from the blood.

High blood pressure:

High blood pressure can damage blood vessels in the kidneys so they don't work as well to remove wastes and extra fluid from the body.

Other causes of kidney diseases include

- A genetic disorder that causes cysts to grow in the kidneys, polycystic kidney disease(PKD)
- An infection
- A drug that is toxic to the kidneys
- A disease that affects the entire body, such as diabetes or lupus nephritis.

- IgA glomerulonephritis
- Disorders in which the body's immune system attacks its own cells and organs, such as Good pasture syndrome.
- Heavy metal poisoning, such as lead poisoning .
- Rare genetic conditions, such as Alport's syndrome.
- Renal artery stenosis

Griffin P. Rodgers, M.D.,(2016)

Stages

The stages of CKD as outlines by the National Kidney Foundation Kidney Disease Outcomes Quality Initiatives

Stage	**Clinical features**	**GFR (mL/min/1.73m^2)**
I	Kidney damage with normal or increased GFR	≥90
II	Kidney damage with a mild decrease in GFR	60–89
III	Moderate decrease in GFR	30–59
IV	Severe decrease in GFR	15–29
V	Kidney failure	<15 or dialysis

American Journal Of Kidney Disease.,(2011)

PATHOPHYSIOLOGY 0F CRF

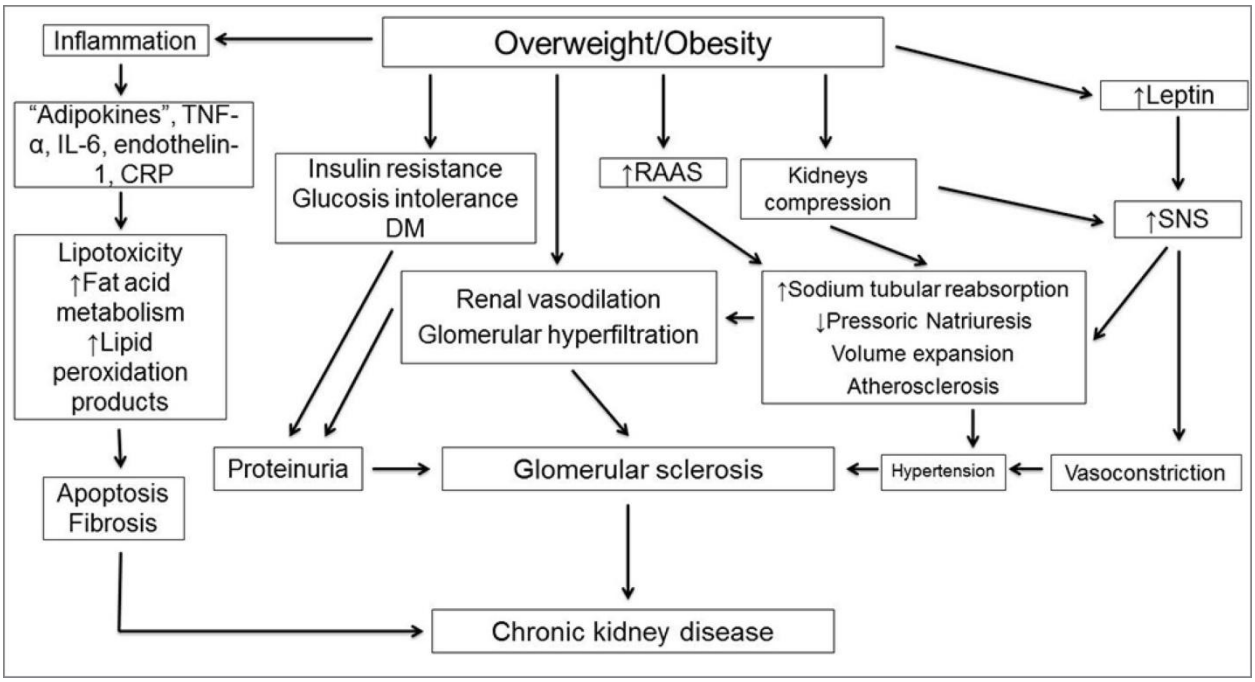


FIG 1.Pathosiology of Chronic Renal Failure

As renal function declines, the end product of protein metabolism (normally excreted in urine) accumulate in the blood. Uremia develops and adversely affects every system in the body. The greater the buildup of waste products, the more pronounced the symptoms are

The rate of decline in renal function and progression of ESRD is related to the underlying disorder, the urinary excretion of protein, and the presence of hypertension.

The disease tends to progress more rapidly in patients who excrete significant amounts of protein or have elevated blood pressure than those without these conditions.

Brunner and Suddarth's .,(2011)

CLINICAL MANIFESTATION

Neurologic manifestation

It includes headache, sleep disturbance, lethargy, muscular irritability, seizures, confusion, coma.

Occular manifestation

Hypertensive retinopathy.

Pulmonary manifestation

It includes uremic lung, pulmonary edema, dyspnea, pneumonia, depressed cough reflex.

Integumentary system

It includes pallor, pigmentation changes, pruritis, echymosis, excoriation, uremic frost, dry scaly skin.

Peripheral neuropathy or musculoskeletal system

It includes parasthesis, motor weakness, restless leg syndrome, muscle cramps.

Psychologic manifestation:

It includes denial, anxiety, depression, psychosis.

Cardiovascular manifestation

It includes hypertension, congestive heart failure, atherosclerotic heart disease, pericarditis, myocardiopathy, pericardial effusion.

Lewis Heitkemper.,(2007)

Gastrointestional system

It includes anorexia, nausea, vomiting, GI bleeding, peptic ulcer, stomatitis, gastritis.

Endocrine / reproductive system

It includes hyperparathyroidism, amenorrhoea, infertility, sexual dysfunction, azoospermia.

Metabolic manifestation

It includes carbohydrate intolerance, hyperlipidimia, nutritional deficiencies, gout.

Hematologic manifestation

It includes anemia, fatigue, bleeding, infection

Lewis Heitkemper.,(2007)

DIAGNOSTIC EVALUATION

- Blood creatinine, electrolytes, blood urea nitrogen level, blood sugar, parathyroid hormone, complete blood count, hematocrit level
- Glomerular filtration rate
- Calcium and phosphate level
- Urinalysis
- Iron studies, hemoglobin
- Doppler study
- Ultrasound scanning
- Kidney biopsy

Black.M.Joyce.,(2009)

Screening:

Some individuals are at a higher risk of developing CKD and, as a result, should be screened regularly for early signs of the condition so that they can receive timely treatment. Annual screening is recommended for people with:

- Hypertension
- Diabetes
- Acute kidney injury caused by medications such as lithium or NSAIDs
- Cardiovascular disease
- A family history of inherited or stage five CKD
- Systemic lupus erythematosus
- Hematuria
- Proteinuria

Outside of these at risk population groups, there is no evident need to screen for compromised kidney function in the general public. In many cases, a routine blood or urine test will detect changes and indicate abnormal function of the kidneys. If there is a positive result, the test should be repeated to confirm the diagnosis.

Glomerular Filtration Rate

The estimated glomerular filtration rate (eGFR) is a useful indicator to assess the function of the kidney, specifically the volume of blood filtered per minute.

A healthy person typically filters at least 90 mL/min and a filtration rate below 60 mL/minute usually indicates that there are significant changes in the kidney function

The concentration of creatinine in the urine is measured and the value can be calculated using a formula that takes into account the individual's age, gender and ethnic group. The albumin:creatinine ratio can also be used to estimate GFR.

Yolanda Smith.,(2016)

Diagnostic Staging

There are six stages of chronic kidney disease based on the eGFR that are used to indicate the progression of CKD and help guide the treatment recommendations.

- Stage 1 (G1): normal eGFR (>90 mL/min) with evidence of kidney damage from other tests.
- Stage 2 (G2): slightly decreased eGFR (60-89).
- Stage 3a (G3a): mildly decreased eGFR (45-59) with mild to moderate decrease in kidney function.
- Stage 3b (G3b): moderately decreased eGFR (30-44) with moderate to severe reduction in kidney function.
- Stage 4 (G4): severely decreased eGFR (15-29) with severe reduction in kidney function and possible symptoms evident.
- Stage 5 (G5): severely decreased eGFR (<15) and referred to as renal failure.

For individuals with stage 1 or stage 2 chronic kidney disease, there is not usually need for treatment but the condition should be carefully monitored with regular eGFR tests to detect any changes.

Individuals with stage 3a CKD have mild to moderate decrease in kidney function and should be tested annually to monitor for changes. Those with stage 3b or stage 4 CKD have moderate to severe reduction and should be tested more often, once every six months. Patients with stage 5 CKD have severely compromised renal function and should be tested for changes every three months.

Imaging Tests

There are several diagnostic imaging tests that may be able to help in the diagnosis of chronic kidney disease and identify any structural abnormalities or obstructions in the urinary flow. This is particularly important to investigate the presence of an enlarged prostate gland in men.

Magnetic resonance imaging (MRI), computerized tomography (CT) and ultrasound scans may also be beneficial in the diagnostic process in some cases.

Kidney Biopsy

In some cases, a biopsy of the kidney tissue may need to be taken. This can be sent to a laboratory where it is examined under a microscope for damage that may be affecting the function of the kidneys.

-Yolanda Smith.,(2016)

COMPLICATIONS OF CHRONIC RENAL FAILURE:

i) ANAEMIA

- Erythropoietin deficiency
- Haematinic deficiency-iron, vitamin b12′ folate.

- Increased red cell destruction: due to mechanical, oxidant and thermal damage during haemodialysis.
- Abnormal red cell membranes: causing increased osmotic fragility
- Increased blood loss: occult gastrointestinal bleeding, blood sampling, blood loss during haemodialysis or due to platelet dysfunction
- ACE inhibitors: may cause anaemia in chronic renal failure, probably by interfering with the control of endogenous erythropoietin release.

ii) BONE DISEASE

- Osteodystrophy:
- Osteomalacia and osteoporosis
- Hyperparathyroidism
- Osteosclerosis

iii) SKIN DISEASE

- Itching is a common and frequently intractable problem in dialysis patients. The cause is multi factorial and includes:
- Dry skin-simple aqueous creams are helpful Chronic renal failure may also cause pseudoporphyria, a blistering photosensitive skin rash.

iv) GASTROINTESTINAL COMPLICATIONS

- Decreased gastric emptying and increased risk of reflux oesophagitis.
- Increased risk of peptic ulceration.
- Increased risk of acute pancreatitis-particularly in continuous ambulatory peritoneal dialysis (CAPD).

- Constipation-particularly in patients on CAPD.

v) METABOLIC ABNORMALITIES

- Gout
- Insulin resistance is a feature of advanced renal impairment, and may contribute to hypertension and lipid abnormalities, but rarely causes clinically significant hyperglycaemia.

vi) ENDOCRINE ABNORMALITIES

- Hyperprolactinaemia
- Increased luteinizing hormone (lh) levels
- Decreased serum testosterone levels
- Absence of normal cyclical changes in female sex hormones
- Complex abnormalities of growth hormone secretion and action
- Abnormal thyroid hormone levels

vii) NERVOUS SYSTEM DISORDERS

- Asterixis, tremor and myoclonus are also features of severe uraemia.
- Rapid correction of severe uraemia by haemodialysis leads to dialysis disequilibrium' due to osmotic cerebral swelling.
- 'Dialysis dementia' is a syndrome of progressive intellectual deterioration, speech disturbances, myoclonus and fits which is now known to be due to aluminium intoxication.

viii) CARDIOVASCULAR DISEASES

- Cardiac hypertrophy.
- Systolic and diastolic dysfunctionare also common. Diastolic dysfunction is largely attributable to left ventricular hypertrophy and contributes to hypotension during fluid removal on haemodialysis.
- Pericarditis is common and occurs in two clinical settings:
- uraemic pericarditis is a feature of severe, preterminal uraemia or dialysis.
- Dialysis pericarditis occurs as a result of an intercurrent illness or surgery in a patient receiving apparently adequate dialysis.

Brianna.,(2017)

POTENTIAL COMPLICATIONS INCLUDE

- Fluid retention which could lead to swelling in the arms and legs.
- High blood pressure, or fluid in the lungs.
- A sudden rise in potassium levels in the blood, which could impair the heart's ability to function and may be life threatening.
- Irreversible damage to the kidneys (end-stage kidney disease), eventually
- requiring either dialysis or a kidney transplant for survival

Brianna.,(2017)

MANAGEMENT

Treatment usually consists of measures to help control signs and symptoms, reduce complications, and slow progression of the disease.

Goals:

A) **Treating the cause**: kidney damage can continue to worsen even when an underlying condition, such as high blood pressure, has been controlled.

B) Treating complications: Kidney disease complications can be controlled.

MEDICAL MANAGEMENT:

- **Medications to lower cholesterol levels:** People with chronic kidney disease often experience high levels of bad cholesterol, which can increase the risk of heart disease.
- **Medications to treat anemia:** Erythropoietin supplements aid in production of more red blood cells, which may relieve fatigue and weakness associated with anemia.
- **Medications to relieve swelling:** People with chronic kidney disease may retain fluids. This can lead to swelling in the legs, as well as high blood pressure.
- **Medications to protect the bones:** vitamin D supplements to prevent weak bones and lower the risk of fracture.

C) **A lower protein diet to minimize waste products in the blood:** As the body processes protein from foods, it creates waste products that the kidneys must filter from the blood.

Rosenberg M.,(2016)

D) Treatment for end-stage kidney disease

Dialysis: Dialysis artificially removes waste products and extra fluid from the blood when the kidneys can no longer do this. In haemodialysis, a machine filters waste and excess fluids from the blood.

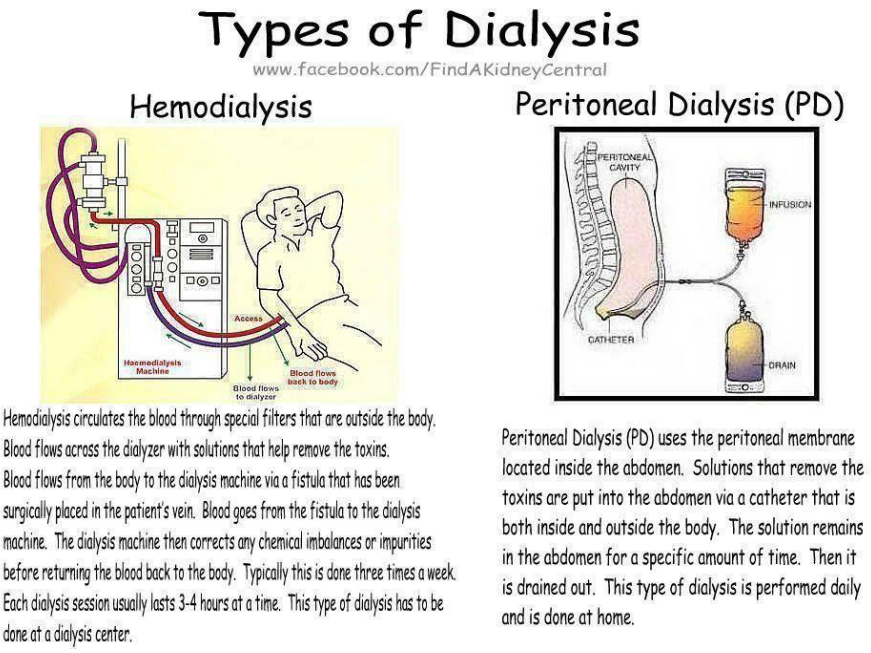


Fig 1.(a) HAEMODIALYSIS Fig 1.(b) PERITONEAL DIALYSIS

PROCEDURE:

Haemodialysis uses an external machine and a special type of filter to remove excess waste products and water from the blood. During haemodialysis, blood passes from the patient's body to the dialysis machine through sterile tubing and into a filter, called a dialysis membrane. For this procedure, the patient has a specialized vascular tube placed between an artery and a vein in the arm or leg (called a gortex graft). Sometimes, a direct connection is made between an artery and a vein in the arm. This procedure is called a Cimino fistula. Needles are then placed in the graft or fistula, and blood passes to the dialysis machine, through the filter, and back to the patient. If the patient requires dialysis before a graft or a fistula is placed, a large diameter catheter (haemodialysis catheter) is placed directly into a large vein in

the neck or leg in order to perform dialysis. In the dialysis machine, a solution on the other side of the filter receives the waste products from the patient.

John P. Cunha.,(2017)

SURGICAL MANAGEMENT:

Kidney transplant. A kidney transplant involves surgically placing a healthy kidney from a donor into the body. Transplanted kidneys can come from deceased or living donors.

- **Potential future treatments:** Regenerative medicine holds the potential to fully heal damaged tissues and organs, offering solutions and hope for people who have conditions that today are beyond repair.
- **Regenerative medicine approaches include**:

A) Boosting the body's natural ability to heal itself

B) Using healthy cells, tissues or organs from a living or deceased donor to replace damaged ones

C) Delivering specific types of cells or cell products to diseased tissues or organs to restore tissue and organ function

Lifestyle and home remedies:

- **Avoid products with added salt.** Lower the amount of sodium that the patient eat each day by avoiding products with added salt, including many convenience foods, such as frozen dinners, canned soups and fast foods.
- **Choose lower potassium foods.** High-potassium foods include bananas, oranges, potatoes, spinach and tomatoes. Examples of low-potassium foods include apples, cabbage, carrots, green beans, grapes and strawberries. Be aware that many salt substitutes contain potassium.

- **Limit the amount of protein eat.** High-protein foods include lean meats, eggs, milk, cheese and beans. Low-protein foods include vegetables, fruits, breads and cereals.

Rosenberg M.,(2016)

COPING AND SUPPORTIVE MANAGEMENT:

Receiving a diagnosis of chronic kidney disease can be worrisome. To help the patients cope with the feelings, consider trying to:

- **Connect with other people who have kidney disease.**
- **Maintain the normal routine, when possible.** Try to maintain a normal routine, doing the activities to enjoy and continuing to work, if the condition allows. This may help to cope with feelings of sadness or loss that the patient may experience after the diagnosis.
- **Be active most days of the week.** With the help of doctor's advice, aim for at least 30 minutes of physical activity most days of the week. This can help to cope with fatigue and stress.
- **Talk with a person with trustworthy.** Living with chronic kidney disease can be stressful, and it may help to talk about the feelings.

Rosenberg M.,(2016)

RESTLESS LEGS SYNDROME:

Definition:

Restless legs syndrome (restless legs syndrome) is a condition in which patient have an uncontrollable urge to move the legs, usually due to leg discomfort. It typically happens in the evenings or nights while sitting or lying down. Moving eases the unpleasant feeling temporarily.

Jeremy., (2011)

INCIDENCE OF RESTLESS LEGS SYNDROME:

The prevalence of restless legs syndrome among ESRD patients was 19.4%, with most patients having moderate to severe disease.

Siraj O. wali.,(2015)

CAUSES AND RISK FACTORS OF RESTLESS LEGS SYNDROME:

Other factors associated with the development or worsening of restless legs syndrome include:

Chronic illness: Certain chronic diseases and medical conditions including iron deficiency, parkinson's disease, kidney failure, diabetes, and peripheral neuropathy often include symptoms of restless legs syndrome.

Medications: Over-the-counter sleeping pills, Antihistamines (found in many cold and allergy pills such as Benadryl, NyQuil, and Dimetapp), calcium channel blockers (used for high blood pressure and heart problems)

Pregnancy: Some women experience restless legs syndrome during pregnancy, especially in the last trimester. Symptoms usually go away within a month after delivery.

John P. Cunha.,(2017)

SIGNS AND SYMPTOMS OF RESTLESS LEGS SYNDROME:

Common descriptions include:

A "creepy-crawly" feeling, tingling, itching, prickling, burning, pulling, tugging, and aching. crawling up their legs, a fizzy soda is bubbling through their veins, or they have a "deep bone itch."

Leg discomfort combined with strong urge to move – Uncomfortable sensations deep within the legs, accompanied by a strong, often irresistible urge to move them.

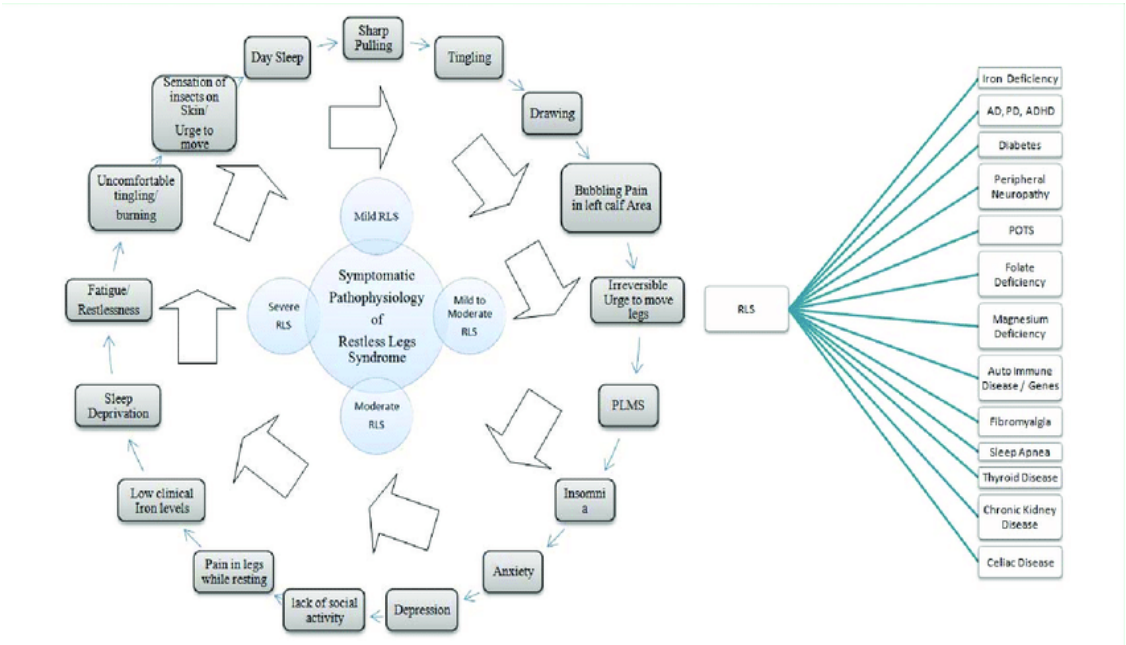


Fig .2 Signs and symptoms of restless legs syndrome

Jeremy.,(2011)

Rest triggers the symptoms – The uncomfortable leg sensations start or become worse while sitting, lying down, or trying to relax.

Symptoms get worse at night – restless legs syndrome typically flares up at night. In more severe cases, the symptoms may begin earlier in the day, but they become much more intense at bedtime.

Symptoms improve while walking or moving the legs – The relief continues as long as the person keeps moving the legs.

Leg twitching or kicking while sleeping – Many people with restless legs syndrome also have periodic limb movement disorder (PLMD), which involves repetitive cramping or jerking of the legs during sleep.

Walters A.,(2011)

DIAGNOSTIC EVALUATION:

Restless legs syndrome (restless legs syndrome) is diagnosed by interviewing the individual about the presence or absence of the following five criteria:

1. An urge to move the limbs usually (but not always) accompanied by or felt to be caused by uncomfortable and unpleasant feelings in the legs.
2. The sensations begin or worsens during periods of rest and/ or inactivity;
3. These sensations are partially or completely relieved by movement (such as walking around or stretching), for as long as the movement continues;
4. These sensations occur predominantly during the evening or night; and
5. These sensations are not symptoms of another medical or behavioral condition.

Rochester MN.,(2012)

Polysomnographic evaluation to assess the frequency of periodic limb movements during sleep(PLMS), which often accompany restless legs syndrome.

Kryger.M.,(2011)

EMG monitoring of the tibialis anterior muscle shows repetitive myoclonic contractions lasting from 0.5 to 10 seconds. The interval between jerks is typically 20 to 40 seconds, with a maximum variation of 5 to 90 seconds.

Christian Guilleminault.,(2012)

TREATMENT MODALITIES FOR RESTLESS LEGS SYNDROME

Medical therapy:

Several prescription medications, most of which were developed to treat other diseases, are available to reduce the restlessness in the legs. These include:

- **Medications that increase dopamine in the brain.** These medications affect levels of the chemical messenger dopamine in the brain. Ropinirole (Requip), rotigotine (Neupro) and pramipexole (Mirapex) are approved by the Food and Drug Administration for the treatment of moderate to severe restless legs syndrome.

  Short-term side effects of these medications are usually mild and include nausea, lightheadedness and fatigue. However, they can also cause impulse control disorders, such as compulsive gambling, and daytime sleepiness.

- **Drugs affecting calcium channels.** Certain medications, such as gabapentin (Neurontin) and pregabalin (Lyrica), work for some people with restless legs syndrome.

- **Opioids.** Narcotic medications can relieve mild to severe symptoms, but they may be addicting if used in high doses. Some examples include codeine, oxycodone (OxyContin, Roxicodone), combined oxycodone and acetaminophen (Percocet, Roxicet), and combined hydrocodone and acetaminophen (Norco, Vicodin).

- **Muscle relaxants and sleep medications.** Known as benzodiazepines, these drugs help the patient to sleep better at night, but they don't eliminate the leg sensations, and they may cause daytime drowsiness. A commonly used sedative for restless legs syndrome is clonazepam (Klonopin). These drugs are generally only used if no other treatment provides relief.

Tarsy D., 2018

ALTERNATIVE THERAPIES:

The Complementary alternative medicine modalities are classified based on classification of the National Centre for Complementary Alternative Medicine (NCCAM) as following:

- Alternative medical systems (acupuncture, Homeopathy, Ayurveda, Siddha, and Unani)

- Mind-body interventions (relaxation techniques, spiritual healing/prayer, hypnosis, meditation, yoga)

- Biologically based therapies (herbal therapy, dietary supplements)

- Manipulative and body-based methods (massage therapy, exercise, chiropractic, or osteopathy)
- Energy therapies (energy healing, Reiki).

Aravapalli S.M. Arjuna Rao.,**(2016)**

NON-PHARMACOLOGIC TREATMENTS

The Relaxis system is a prescription medical device designed for the treatment of primary restless legs syndrome symptoms. The system consists of a digital controller and pad that provide vibration as a counter stimulus to restless legs syndrome, dysphoria at the time of an attack.

Relaxis is appropriate for newly diagnosed patients who do not want to use drugs as well as patients who currently use restless legs syndrome drugs and want to decrease their dosage or stop using their medications altogether. Also, those who are experiencing drug side effects or who need additional help getting a good night's sleep may benefit. Patients who find vibration irritating should not use Relaxis. In clinical trials, reported adverse events (mild to moderate in severity) included leg cramping, tingling, soreness, pain, and motion sickness.

Fred Burbank, MD, (2016)

Near-infrared light (NIR), which has been used in the treatment of neuropathy and wound healing, can also be used in restless legs syndrome treatment. Treatment with a vasodilator, such as NIR-induced nitric oxide, could conceivably temporarily decrease symptoms.

Buchfuhrer.,(2016)

"Immediate physical activity relieves restless legs syndrome and the longer the activity duration, the longer the relief may last after stopping the activity,

Buchfuhrer.,(2016)

Scalp acupuncture has positive results with restless legs syndrome, and it usually produces immediate beneficial responses in the initial treatment. Significant and complete reduction of restless legs syndrome has occurred in approximately 85% of people receiving scalp acupuncture in the clinics. If restless legs are not well controlled by scalp acupuncture alone, patients may experience better results when combining treatment with body acupuncture. Commonly used points are Li-3, GB-34, Sp-6, and UB-18.

Jason Jishun Hao DOM .,(2011)

Non-pharmacologic treatments such as stretching and exercises are important because they can offer patients relief from symptoms as well as improve sleep.

Brian Koo, MD,yale, restless legs syndrome center., (2016)

FATIGUE AMONG CHRONIC RENAL FAILURE PATIENTS:

DEFINITION OF FATIGUE

Fatigue (also called exhaustion, lethargy, languidness, languor, lassitude and listlessness) is a state of awareness describing arrange of afflictions, usually associated with physical and mental illness, through varying from general state of lethargy to a specific work-induced.

Emilia.,(2011)

MECHANISM OF FATIGUE IN CHRONIC RENAL FAILURE

The main kidney function is to keep the extracellular fluid, the fluid found outside the body cells. The kidneys make sure that this extracellular fluid has the right composition to feed the cells with the needed salts, acid, nutrients, and many other constituents.

Another very important function of the kidneys is the production of the following hormones:

- **Angiotension,** a hormone that raises blood pressure by constricting blood vessels and also stimulates the adrenal cortex to produce another hormone,
- **Aldosterone**, It is very important in regulating sodium excretion
- **Erythropoietin**, a hormone that stimulates the bone marrow to produce more red cells whenever their number is reduced.
- **Prostaglandins**, which help regulate blood pressure, sodium excretion, and other functions.

If kidneys are not working properly, the production of erythropoietin may not happen or may not happen in enough amounts to stimulate the bone marrow to produce more red cells and the result is anemia. This explains why people with kidney failure can be very tired and have fatigue.

Emilia.,(2011)

Nurses role in fatigue

- ♣ Assess the general condition of the patients.
- ♣ The nurse need to identify and assess fatigue in patients with chronic renal failure, vital of the patient health, and quality outcomes of the patient.
- ♣ The nurse help the patients to develop strategies and manage it effects.
- ♣ The nurse should check evaluation of patient medications and lab results, and the nursing interventions.
- ♣ Practice nurses largely important for the potential development of their role in this area, but identified barriers and training needs which must be addressed to enable them to feel confident in managing of patients with fatigue.

Broscious.S.K.,(2008)

STRETCHING EXERCISE:

Exercises that stretch the muscle fibers with the aim to increase muscle-tendon flexibility, improve range of motion or musculoskeletal function, and prevent injuries.

Ketan Bhatikar's.,(2012)

Stretches are either dynamic (meaning they involve motion) or static (meaning they involve no motion).

- Dynamic stretches: dynamic stretching exercises should perform the exercises (leg raises, arm swings) in sets of eight to twelve repetitions.

- Static stretches: Static exercise (meaning it does not use motion or movement), also known as isometric exercise, exerts muscles through contractions at high intensities (tensing) without movement of the joints.

Kurtz., (2012)

BENEFITS OF STRETCHING EXERCISE

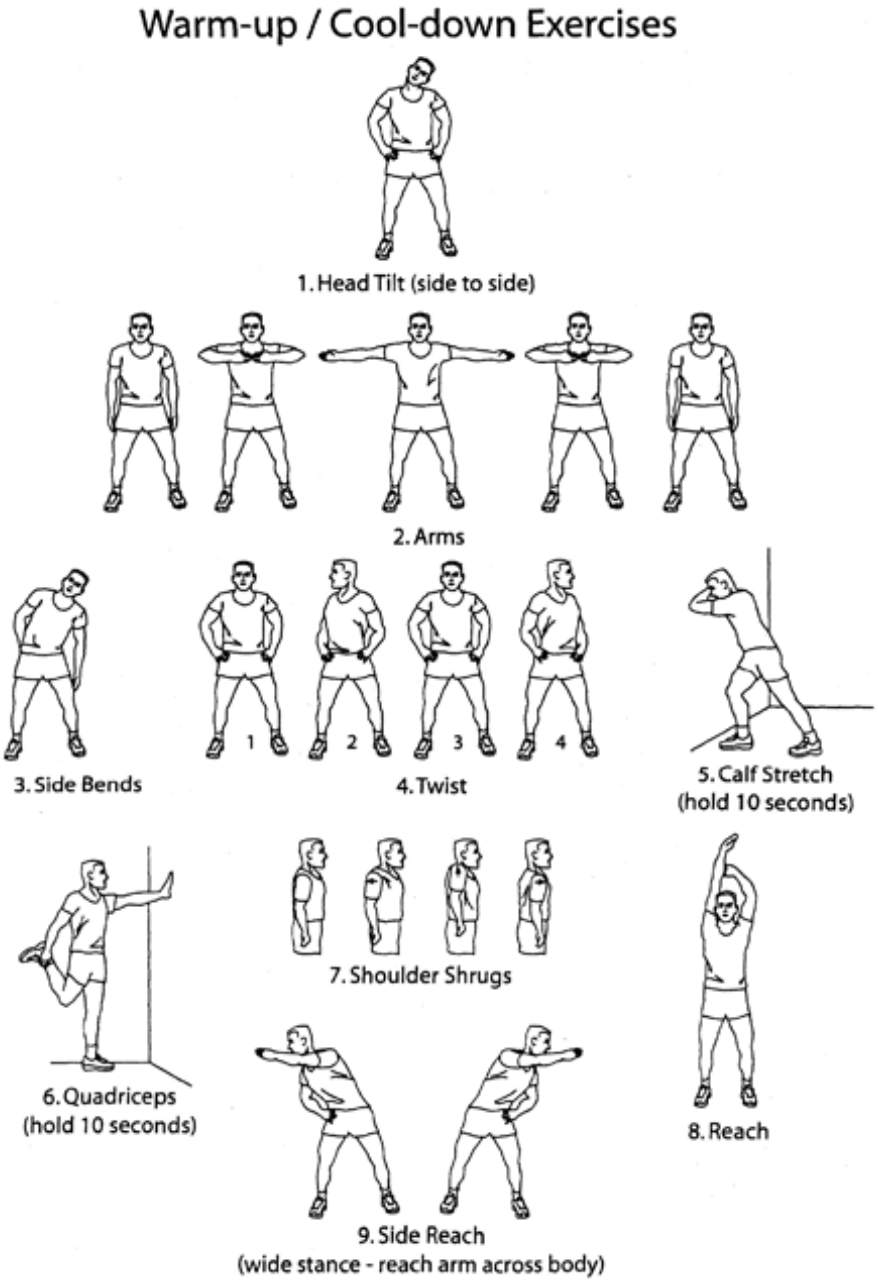
- Improve Body Composition and Weight Management stated that: Exercising the muscles increases the lean muscle mass and improves the body composition, which is the relative percentage of fat and lean mass.
- Healthy joints.
- Improved bone mineral density.
- Stability, balance and ease of movement.
- Improved posture.

-Michelle matte.,(2017)

STEPS OF STRETCHING EXERCISE:

STEP 1:

The initial warm up exercises is for 5minutes. It consists of a gradual increase in intensity in physical activity, joint mobility exercise, and stretching; it is a preparatory exercises done to warm up the muscles.



STEP 2:

It includes seven stretching exercises namely hip rotation to the sides for 3 minutes, quadriceps stretch for 3 minutes, knee-to-stretch for 3 minutes, hamstring stretch for 3 minutes, straight leg raise for 3 minutes, gluteal stretch for 3 minutes, side lying leg lift for 2 minutes, and the duration of this procedure is 20 minutes.

A)<u>Hip rotation to the sides</u>:

Steps:

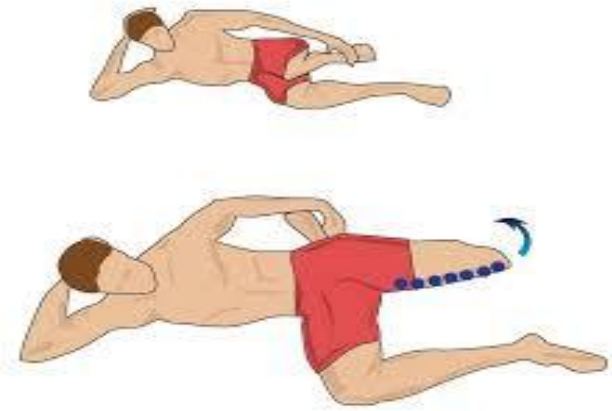
- Lie on the sides with the hips and knees bent, so that the heels are in line with head, torso, and hips.
- Open the hips by rotating the top knee toward the upwards while maintaining contact between the heels.
- Lower the knee to the starting position.

- Complete the set on one side before repeating on the opposite side.

B) Quadriceps stretch:

Starting position: Lie down on the side with the shoulders, hips, and knees in a straight line. Choose where to place the bottom arm, wherever feels most comfortable.

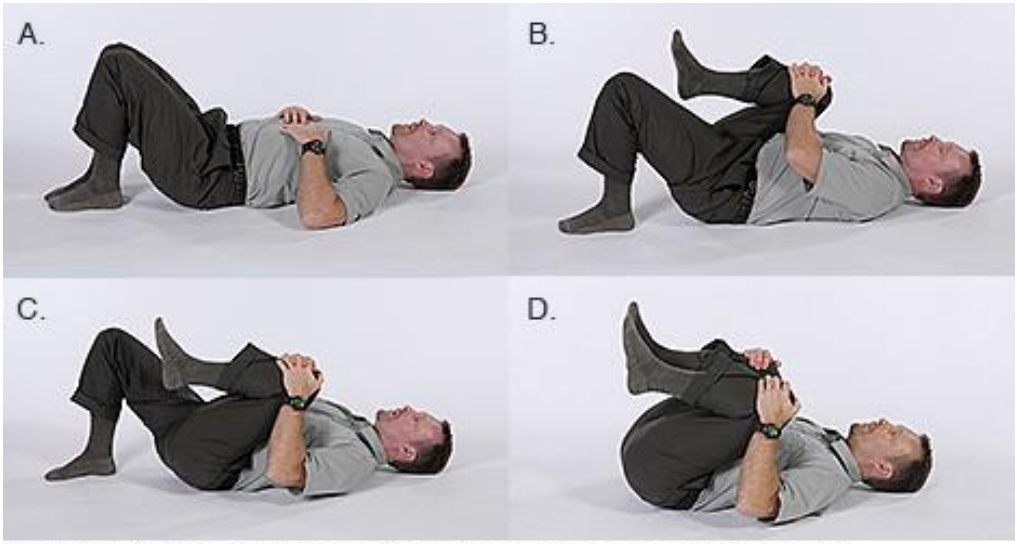
While doing standing quadriceps: Stand on one foot, holding the back of a chair to balance. With the free hand, hold the ankle of the stretching leg behind



A) Side lying quadriceps

B)Standing quadriceps

C) Knee-to-chest:



STEPS:

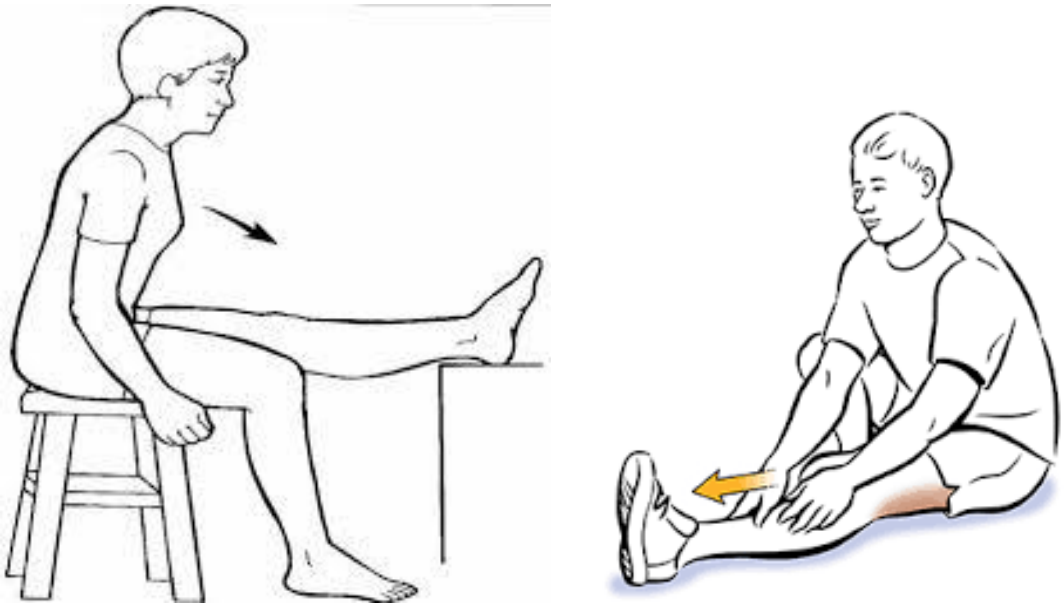
- Bring one knee to the chest, keeping the other foot flat on the floor (or the other leg straight, whichever feels better on the lower back). Keep the lower back pressed to the floor. Hold for atleast 15 to 30 seconds.
- Relax and lower the knee to the starting position. Repeat with the other leg.
- Repeat 2 to 4 times with each leg.
- To get more stretch, put other leg flat on the floor while pulling the knee to the chest.

Matt Biss.,(2013)

D) HAMSTRING EXERCISES:

Hamstring Stretch with Towel

i.Lying hamstring stretch



ii.Seated Hamstring stretch

i)Lying hamstring stretch:

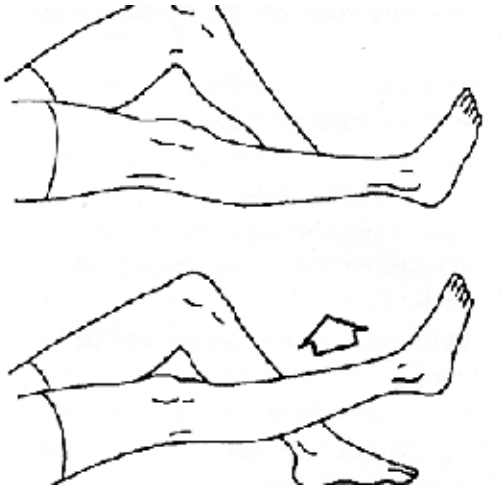
- Lie on the back, supporting the thigh with the hand or with a towel wrapped around it.
- Slowly straighten the knee until a stretch is felt in the back of the thigh, trying to get the bottom of the foot to face the ceiling, one leg at a time.
- Hold the position initially for 10 seconds, and gradually work up to 20 to 30 seconds.

ii) Seated hamstring stretch:

- While sitting at the edge of a chair, straighten one leg in front of the body with the heel on the floor
- Then, sit up straight and try pushing the abdomen towards the thigh without leaning the trunk of the body forwards
- Hold this stretch for 30 seconds.
- Repeat3 times for each leg.

F) STRAIGHT LEG RAISE:

The straight leg raise exercise is one of the physical therapy that can help improve the lower extremity strength and help improve the function related to walking.



<u>Here's how to work</u>:

- Sit or lie down on the back with the legs straight out in front of the investigator.
- Bend the knee of the non-operated leg to a 90-degree angle keeping the foot flat on the floor.
- Tighten the muscles on the straight leg trying to contract the quadriceps
- Keep the quadriceps tightened, and then slowly lift the operated leg six inches off the floor(by contracting the front thigh muscles)
- Hold for the three seconds.
- Slowly lower the leg to the floor.
- Relax and repeat 10 more times.

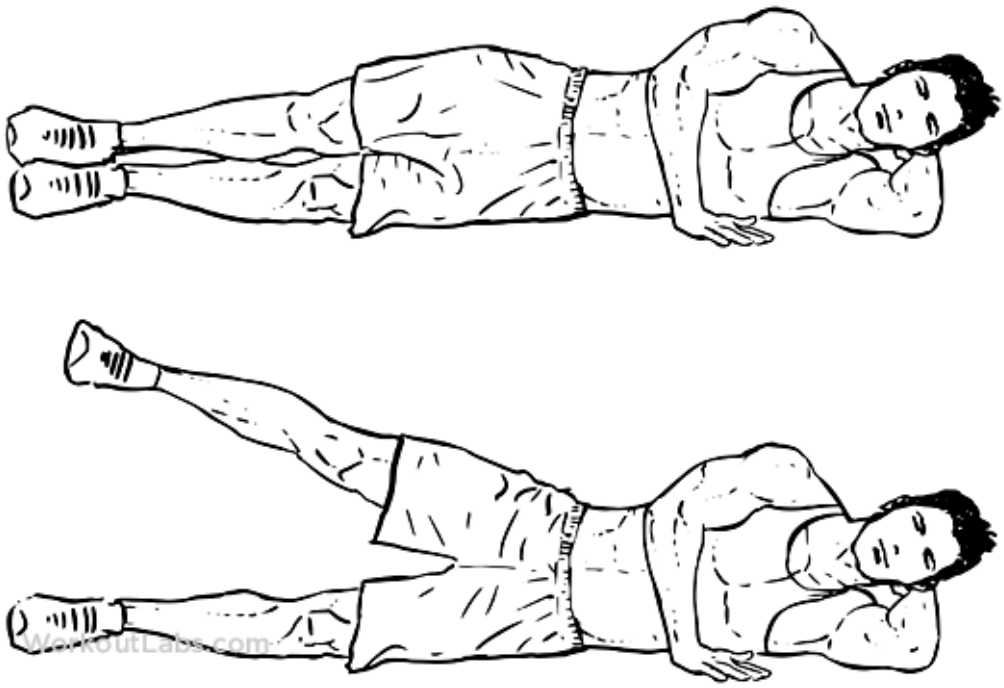
Laura Inverarity, DO.,(2017)

G) Gluteal stretch:

Steps

- Lie on the back with knees comfortably bent.
- Place the ankle of the one leg onto the opposite knee.
- Put one hand on the knee and one just above the ankle.
- Slowly pull the leg towards the opposite shoulder until that is felt stretch in the buttocks.
- Hold the stretch for 10 seconds and repeat for another leg.

F)Side lying leg lift:



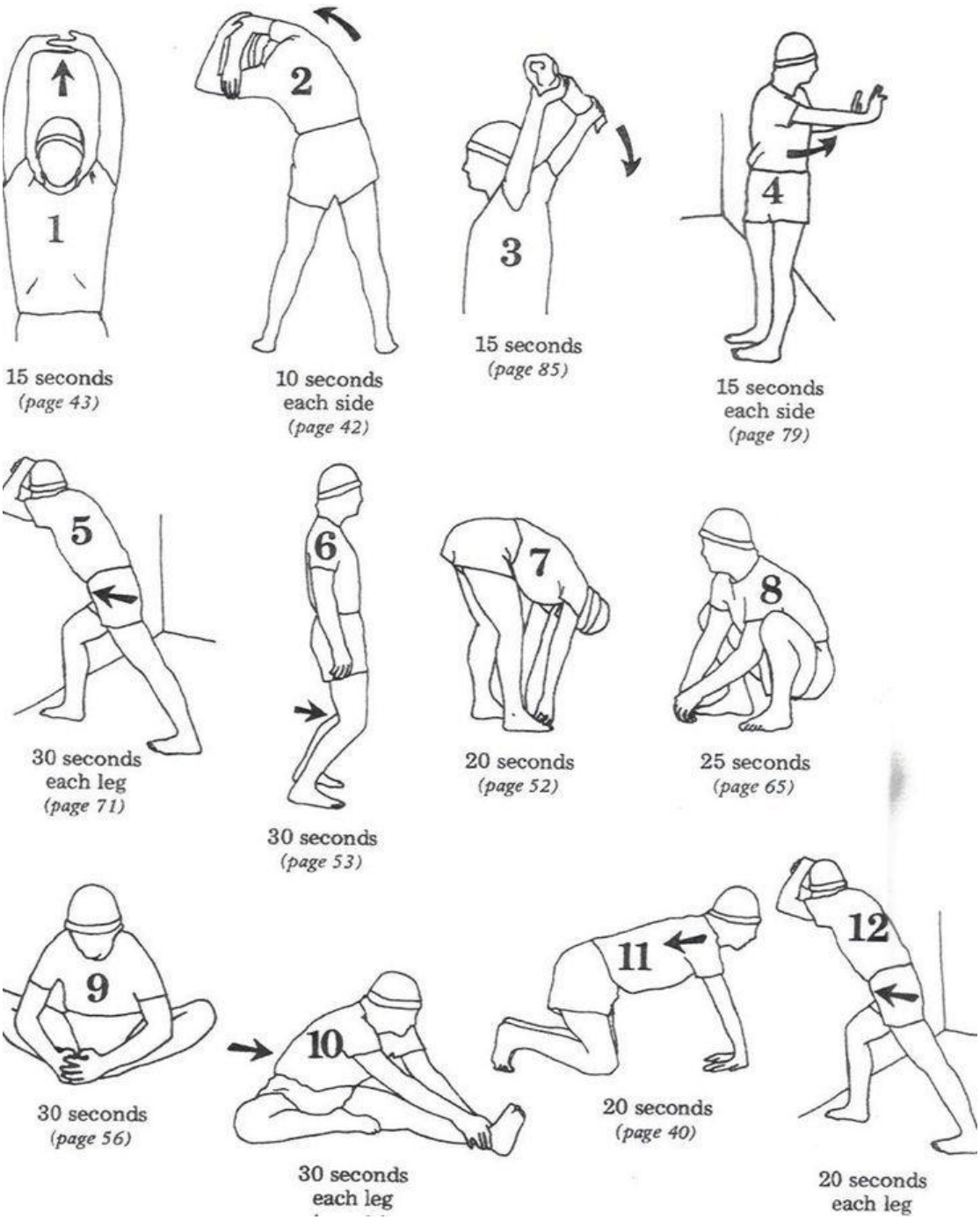
STEPS:

- Lay on the side and support the upper body with the elbow.
- Raise the upper leg so that it is not touching the other leg. Keep the abs tight.
- Slowly raise the leg 45 degrees while contracting the abdominal muscles.
- Hold for 2 seconds, then slowly return to starting position.
- Repeat for the other side.

STEP 3:

The relaxed exercises for 5 minutes. It refers to the variety of methods and manipulations used to reduce stress, muscle tension, and anxiety in the body.

COOLED DOWN EXERCISE:



STRETCHING EXERCISES TO ALLEVIATE RESTLESS LEGS SYNDROME

Stretching is believed to be one of the potential ways to reduce restless legs symptoms, both before an attack and during. Stretching takes away some of the energy out of the muscles, and that energy reduction appears to be one of the ways to both relief restless leg and prevent it from occurring. Stretching before bed appears to be effective at preventing some restless legs syndrome episodes, but only if it's combined with other lifestyle changes.

William blahd.,(2018)

STRETCHING EXERCISES TO REDUCE FATIGUE:

Exercises also increase the blood flow to muscle and greater amount of open capillary surface area in working muscles which result in a greater flux of urea and associated toxins from the tissue to the vascular compartment helps in subsequent removal of the dialyzer. There are different exercises like flexibility exercises and strengthening exercises to improve the physical functioning of the patient. Leg stretch exercises done during the dialysis procedure like quadriceps knee strengthening exercise, hamstring exercise and gluteal strengthening exercise will improve the muscle protein synthesis and breakdown, which helps in determining both strength and overall function

-Veeram Reddy Thejaswi., (2016)

PART – II

Section A : STUDIES RELATED TO INCIDENCE AND PREVALENCE OF CHRONIC RENAL FAILURE

Van Manen JG (2001) This study was conducted to determine the prevalence of CKD and their employment status in new end-stage renal disease (ESRD) patients at the start of dialysis and after 1 year. Prospective follow-up study in which 38 of 48 Dutch dialysis centers participate.659 patients who had started on dialysis and who were between 18 and 65 years old were included. Patients were re-examined after 12 months. The results showed that at the start of dialysis, 35% of patients were employed, in contrast to 61% of the general Dutch population. Within 1 year, the proportion of employed patients decreased from 31% to 25% of haemodialysis patients, and from 48% to 40% of peritoneal dialysis patients. As the percentage of employed patients at the start of dialysis is about half the expected percentage, loss of work is an important issue in both predialysis and dialysis patients. Improvements in physical and psychosocial functioning are potentially preventive of loss of work in patients who are employed when they start dialysis.

Qier-Li zhang.et.al.,(2008) conducted a study on prevalence of chronic kidney disease at division of clinical epidemiology and aging research at Germany, 20 studies were conducted in different population and number of participants ranged from 237 to 65181, Results shows that, the median prevalence of chronic kidney disease was 7.2% in persons aged 30 or older, 23.4 to 35.8% of prevalence of CKD was in the age group of 64 years or older.

Nurul Huda.et.al.,(2012) The prevalence of kidney disease, particularly diabetic and hypertensive kidney disease with their socio-demographic factors. A cross sectional survey was carried out at certain selected slum areas of Mirpur in Dhaka city of Bangladesh over the period

from July 2003 to June 2005, and a total of participants ranging from 15 to 65 years were studied. The analysis discovered that 4.1% of the participants were diabetic, 11.6% were hypertensive, and 7.7% had proteinuria. Based on MDRD equation, 13.1% of the participants were detected as having chronic kidney disease (CKD) while with Cockcroft-Gault equation 16% had CKD. Overall the combined prevalence of DM, hypertension, and proteinuria among CKD group was also demonstrated to be significantly higher (3.8% with Cockcroft-Gault equation and 5.3% with MDRD equation) than that of normal population. CKD is more prevalent with respondents having monthly income of BDT <5000 42.0% whereas 19.3% of the respondents had monthly income of BDT >20000. Regarding monthly family income, median were BDT 25000, among them 32.7% were in category of BDT 20001-30000 and 28.0% were in category of BDT 10001-20000.

Singh et al.,(2013) conducted a study regarding the rising incidence of chronic kidney disease that is likely to pose major problems for both healthcare and the economy in future years. In India, it has been recently estimated that the age-adjusted incidence rate of ESRD to be 229 per million population (pmp), and >100,000 new patients enter renal replacement programs annually. A cross sectional screened 6120 Indian subjects from 13 academic and private medical centers all over India. As obtained personal and medical history data through a specifically designed questionnaire. Blood and urine samples were collected. The total cohort included in this analysis is 5588 subjects. The mean±SD age of all participants was 45.22±15.2 years (range 18–98 years) and 55.1% of them were males and 44.9% were females. The overall prevalence of CKD in the SEEK-India cohort was 17.2% with a mean eGFR of 84.27±76.46 versus 116.94±44.65 mL/min/1.73 m2 in non-CKD group while 79.5% in the CKD group had proteinuria. The prevalence of CKD was observed to be 17.2% with 6% have CKD stage 3 or worse.

Leila Malekmakan et al.,(2013)conducted a study to assess CKD prevalence and its related risk factors in elderly population of Fars province at Southern Iran; In this cross sectional study a total of 1190 elderly people are enrolled, and demographic and medical data were obtained. Data were analyzed by SPSS, and P of less than 0.05 was considered as statistically significant. Results showed that the prevalence of CKD stages III–V was 27.5% in the 60–69 years age group, 36.5% in the 70–79 years age group, and 40% in the ≥80 years age group. The prevalence of CKD increased with ageing in both men and women. The gender was the strongest risk factor for CKD in the current study. Overall we have seen that in each age group the prevalence of CKD in women was higher than men. It may be a result of the difference between women and men in glomerular structure, glomerular haemodynamics, muscle mass, and the hormone metabolism.

L.Rahman.,(2013) a study was conducted to determine theassociation between epidemiological pattern of renal insufficiency with socio-demographic factors, kidney related factors and others factors. Sources of data include patient interviews, diagnosis cards and case records. Respondents were categorized to their CKD stage according to their estimated GFR on Modification of Diet in Renal Disease (MDRD). The sample comprised 150 patients suffering from CKD with male and female ratio being 1.5:1, mean age of the population was 47 years (SD ± 14.5), 47.3% of the respondents had history of streptococcal throat infection and 10% had previous kidney disease Renal Replacement Therapy (RRT) was the commonly advised therapy for CKD indicating very late diagnosis of CKD. Regarding duration of disease, most of the respondents were in the category of 1 year or less (45.3%), indicating recently diagnosed CKD. The current study revealed that 10% of the respondents had history of previous kidney disease other than CKD.

Y. J. Anupama and G. Uma et.al.,(2014) conducted a study to assess the prevalence of CKD in urban populations, but there is a paucity of such

studies in the rural populations. This project was undertaken to study the prevalence of CKD among adults in a rural population near Shimoga, Karnataka and to study the risk factor profile. Door-to-door screening of 2091 people aged 18 and above was carried out. The total number of subjects studied was 2091. Mean age was 39.88 ± 15.87 years. 45.57% were males. Mean age was 39.88 ± 15.87 years. The subjects were predominantly young with more than 70% aged below 40 years. There was a female preponderance with females constituting (54.43%) of the population studied. 36.39% did not have any education, whereas 29.17% and 23.81% had primary and higher secondary education respectively. Only 11% had received any form of college education

Talwalkar P, et al. (2015) conducted the study to assess the prevalence of chronic kidney disease in type 2 diabetes patients in India**, t**his observational, multi-center, cross-sectional study enrolled T2DM patients of either gender aged 30 years or above. Patients with diagnosis of T1DM, acute kidney injury, symptomatic urinary tract infection, history of hematuria, known renal transplant, on maintenance dialysis, participation in any interventional study within past 3 months and pregnant women were excluded from the study. The study is aiming to enroll a total of 3000 T2DM patients, and the data from a planned interim analysis of 1500 patients is presented. This analysis revealed that 697 (46.47%) of the T2DM patients had CKD (Urinary ACR [UACR] ≥30 mg/g and/or estimated GFR (eGFR) <60 mL/min/1.73 m^2). Renal dysfunction was found as per eGFR criteria (<60 mL/min/1.73 m^2) and UACR criteria (≥30 mg/g) in 22.60% and 34.5% of study population respectively.

Samar Abd ElHafeez et.al.,(2017) conducted a study focusing on CKD surveys at the community level and high-risk groups. The prevalence of CKD in each study group was expressed as a range and pooled prevalence rate of CKD was calculated as a point estimate and 95%CI. No meta-analysis was done. Data were presented for different populations. In the community-level studies, based on available medium-quality and high-quality studies, the

prevalence of CKD ranged from 2% to 41% (pooled prevalence: 10.1%; 95%CI 9.8% to 10.5%). The prevalence of CKD in the high-risk groups ranged from 1% to 46% (pooled prevalence: 5.6%; 95%CI 5.4% to 5.8%) in patients with HIV (based on available medium-quality and high-quality studies), 11%–90% (pooled prevalence: 24.7%; 95%CI 23.6% to 25.7%) in patients with diabetes (based on all available studies which are of low quality except four of medium quality) and 13%–51% (pooled prevalence: 34.5%; 95% CI 34.04% to 36%) in patients with hypertension (based on all available studies which are of low quality except two of medium quality.

Section B : STUDIES RELATED TO RESTLESS LEGS SYNDROME AMONG PATIENTS WITH CHRONIC RENAL FAILURE.

Giovanni Merlino et.al.,(2010) A study was conducted to analyze the characteristics of restless legs syndrome and its consequences on nocturnal rest in nondialyzed patients with CRFand to identify possible predictors of restless legs syndrome occurrence in nondialyzed patients with CRF. We recruited 138 nondialyzed patients with CRF (mean age: 69.8 +/- 11.7 years; male: 61.6%) and 151 controls (mean age: 60.2 +/- 18.6 years; male: 42.4%). An expert in sleep medicine investigated the presence of Restless Legs Syndrome by means of a face-to-face interview. Fifteen nondialyzed CRF patients and five controls were diagnosed as restless legs syndrome affected. A multivariate analysis confirmed that restless legs syndrome was independently associated with CRF in nondialyzed patients (P = 0.004). CRF patients restless legs syndrome (+) were more commonly women and showed the presence of an iron deficiency compared with the restless legs syndrome (-) ones. Independent predictors of restless legs syndrome in nondialyzed CRF patients were: female sex (OR: 10.7, 95% CI: 2.2-31.3; P = 0.004) and percentage of transferrin saturation (OR: 0.6, 95% CI: 0.4-0.9; P = 0.04).

Yousaf Jamal et.al.,(2014) To study the frequency of restless legs syndrome in patients of end stage renal disease undergoing maintenance haemodialysis. A Cross sectional descriptive study. In which one hundred and ninety four (n=194) patients of End stage renal disease who had been on maintenance haemodialysis for at least 3 months, were included in the study after full informed consent and using consecutive sampling. The results showed that the frequency of restless legs syndrome was found to be 12.4% in patients undergoing haemodialysis (10.5% in males versus 16% in females). The mean duration of haemodialysis was higher among restless legs syndrome positive patients (12.88 ± 5.543 months) as compared to restless legs syndrome negative patients (6.94 ± 4.610 months).

Siraj O. Wali et.al.,(2015) This study was conducted to determine the prevalence of restless legs syndrome in Saudi patients with end-stage renal disease (ESRD) on haemodialysis. A cross-sectional study was carried out in 3 haemodialysis centers in Jeddah, Saudi Arabia, between June 2012 and September 2013. All patients were individually interviewed and data was collected on the following: demographic features, medical history, laboratory test, the International Restless legs syndrome Study Group questionnaire, Epworth Sleepiness Scale (ESS), and Berlin Questionnaire. Results showed that the prevalence of restless legs syndrome among ESRD patients was 19.4%, with most patients having moderate to severe disease. The restless legs syndrome was significantly associated with obstructive sleep apnea ($p<0.0001$) and excessive daytime sleepiness based on the ESS ($p=0.009$). Administration of aspirin ($p=0.037$) and anticoagulants ($p=0.035$) were also associated with increased risk of restless legs syndrome.

Seyed Seifollah Beladi-Mousavi et.al.,(2015) The study was conducted to investigate the clinical factors associated with restless legs syndrome among ESRD patients. This cross-sectional study was conducted on ESRD patients undergoing maintenance haemodialysis in three haemodialysis centers in

Ahvaz city in Southwest Iran. Blood samples were obtained prior to a dialysis session to check the routine laboratory test results and assess the adequacy of dialysis. The presence of restless legs syndrome was assessed by using the international restless legs syndrome study group diagnostic criteria. The International Restless legs syndrome Study Group scale was also used to evaluate the severity of the restless legs syndrome symptoms. The results showed of the 139 haemodialysis patients enrolled in this study, 60 were female (43.2%) and 79 were male (56.8%), with a mean age of 51.82 ± 13.31 years. The prevalence of restless legs syndrome was 15.8% (22 patients), with 50% of them (11 patients) having severe or very severe symptoms. There was a significant relationship between restless legs syndrome and longer durations of dialysis ($P < 0.001$). The mean level of serum ferritin was lower in patients without restless legs syndrome, but it was not significant ($P = 0.065$).

Rafie S, Jafari M et.al.,(2016) the study was conducted to determine the prevalence, risk factors, and severity of restless legs syndrome in haemodialysis population. The participants of this cross-sectional study were 137 patients including 73 males and 64 females from the dialysis centers of Razi and Golestan Hospitals in Ahvaz, it was started in May and ended in July 2014. The syndrome was diagnosed according to the diagnostic criteria proposed by "International restless legs syndrome Study Group Rating Scale". The restless legs syndromes Severity-scale questionnaires were filled for the patients who had all the four symptoms of this syndrome. The 137 study patients included 73 (53.3%) males, 64 (46.7%) females, 43 patients (32.1%) with diabetes, and 93 patients (67.9%) without diabetes. There were 50 (36.5%) patients diagnosed with restless legs syndrome. The mean age of the restless legs syndrome patients was 56.1 ± 9.80 years and that of the non-restless legs syndrome patients was 1.50 ± 14.6 years. The mean BUN was 46.9 ± 13.8 mg/dL in the restless legs syndrome group and 44.8 ± 16.4 mg/dL in the non-restless legs syndrome group. The mean hemoglobin was 9.47 ±

1.40 g/dL in the restless legs syndrome group and 9.23 ± 1.41 g/dL in the non-restless legs syndrome group. The dialysis duration in the restless legs syndrome group was 2.53 ± 2.16 years and 2.57 ± 2.85 years in the non-restless legs syndrome group. Among the variables, diabetes was the only predicting factor for the development of restless legs syndrome.

Andreia Freire de Menezeset.al.,(2017) This study was conductedto diagnose restless legs syndrome in a group of chronic kidney patients on dialysis, and to determine its frequency and severity, compare the prevalence and severity of the condition among dialytic modalities, and identify possible predictive factors in this population. An observational and cross-sectional study with 326 patients who had been on dialysis for more than 3 months, 241 on haemodialysis and 85 on automatic peritoneal dialysis (APD), using the criteria established by the International Study Group on restless legs syndrome for the diagnosis and the restless legs syndrome Rating Scale to determine its severity. Results showed that the restless legs syndrome was diagnosed in 19.3% of the patients, 52.4% with severe or very severe forms. Patients with and without restless legs syndrome did not differ in clinical and demographic characteristics and dialytic modality; however, patients on APD presented higher restless legs syndrome severity compared to the haemodialysis group.

SECTION C: STUDIES RELATED TO FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE

H.E. Liv.,(2006) conducted a study on fatigue and associated factors in haemodialysis patients in Taiwan by research in nursing and health, The purpose of this co relational study was explore the fatigue and associated physiological and psychological and situational factors, 119 Taiwanese haemodialysis patients was elected by systemic sampling , results indicates the level of fatigue were mild. Three variables (gender, employment and depression) had significant impact on fatigue at ($p<0.05$). Stepwise regression

showed that depression, age and urea reduction ratio were significant predictors for overall fatigue and two of its dimensions.

Manisha Jhamb et.al.,(2013) conducted a study to examine the prevalence and severity of fatigue among non-dialysis-dependent CKD and end-stage renal disease (ESRD) patients, to examine the association of fatigue with subjective and objective sleep quality, and to identify other modifiable factors associated with fatigue. A cross-sectional survey of 87 non-dialysis-dependent CKD (eGFR ≤45 ml/min/1.73 m 2) and 86 ESRD patients was done using the Functional Assessment of Chronic Illness Therapy – Fatigue (FACIT-F) and 36-Item Short-Form (SF-36) vitality scale. Higher FACIT-F score denoted less fatigue. Objective sleep was assessed using in-home. Predictors of fatigue were determined using a linear regression model. The results showed that the mean FACIT-F score among all participants was 34.5 ± 11.0. Mean scores were similar among CKD and ESRD groups (34.25 ± 11.28 vs. 34.73 ± 10.86; p = 0.73).

Alikari Victoria.,(2016) A study was conducted to investigate the levels of fatigue and its correlation with quality of life of haemodialysis patients. Results showed that among 134 haemodialysis patients, the majority of patients (52,9%) seemed to have low rates of fatigue (10 <FAS <= 20). However, 15% of these patients seemed to appear high to very high levels of fatigue (30 <FAS <= 50). Studying the quality of life of these patients. In particulars, patients who experience higher rates of fatigue seem to have worse quality of life (MVQOLI total score 2.90) than those experiencing lower rates of fatigue (MVOQLI total score 3.67) (p <0,005). The analysis of the results enable us to understand the correlation between fatigue and quality of life among haemodialysis patients with ESRD and the importance of prevention, diagnosis and treatment of fatigue in order to optimize the quality of life in dialysis patients with ESRD.

Si-Yuan Wang et.al.,(2016) This study aimed to assess fatigue in haemodialysis patients and to investigate risk factors of fatigue in Chinese patients receiving maintenance haemodialysisin China. Eligible patients completed questionnaires including demographic information, a Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-Fatigue), the Family APGAR Index (APGAR), the medical outcomes study health status-Social Functioning subscale (SF-36,SocF), and the Pittsburgh sleep quality index (PSQI). A total of 345 haemodialysis patients (216 men and 129 women, age 55.6±12.8) were recruited in this study. The score of FACIT-Fatigue was 39 (Interquartile Range, 31-44). Fatigue was correlated with PSQI scores ($p<0.001$), SocF scores ($p<0.001$), comorbidity ($p=0.006$), exercise time≤1 hour per day ($p=0.003$), adequacy of dialysis ($Kt/V<1.2$ $p=0.016$), APGAR scores ($p=0.014$), and high score ($p=0.043$).

Sofia Zyga et.al (2016) The aim of this study was to investigate the levels of fatigue and demographic factors affecting fatigue among patients with End Stage Renal Disease undergoing haemodialysis.This quantitative study was carried out in two Dialysis Units of Hospitals in Athens Region. Between January 2015 and June 2015, 129 haemodialysis patients completed the Greek Version of the Fatigue Assessment Scale (FAS). The mean FAS score was 24.99. 49 patients (38.0%) were non fatigued, 61 patients (47.3%) were fatigued, and 19 patients (13.7%) were extremely fatigued. Higher levels of fatigue were reported among haemodialysis patients residing in urban areas, in those with low educational level and unemployed.

Section D: STUDIES RELATED TO EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AMONG PATIENTS WITH CHRONIC RENALS FAILURE.

Jasvinder Kaur et,al.,(2016), the study was aimed to find out the effectiveness of muscle stretching exercise in Restlessness leg syndrome among haemodialysis patients. A quantitative research approach with times series research design was used for the study to assess the effectiveness of muscle stretching exercise on restlessness leg syndrome. The study was conducted in dialysis unit of selected multi-speciality hospital. Simple random sampling technique was used to assign the samples in experimental and control group in the study. Data was collected from 86 chronic kidney disease patients undergoing haemodialysis. The restless legs syndrome rating scale was used measure the magnitude of the restless legs syndrome. The result of the study showed that in baseline the restless legs syndrome mean score was 0.59 and after a week of muscle stretching exercise program implementation the mean score was reduced to 0.34. Intervention was found to be effective in reduction of restless legs syndrome symptoms of haemodialysis patients significantly ($p \leq 0.05$), whereas there was no significant change found in the control group.

Thenmozhi P .et .al.,(2016) The study was conducted to assess the effectiveness of warm massage in reducing the level of restless leg syndrome among patients with diabetes mellitus. First 15 samples were considered as experimental group and remaining 15 samples were considered as control group. Interview was conducted to collect the demographic variables and followed by restless leg syndrome severity scale was used to assess the level of restless leg syndrome for both the group. Experimental group received the warm massage from the foot to knee for 5 days and control group received the regular treatment. At the end of 5th day level of restless syndrome was assessed for both the group by using the Restless Leg Syndrome severity rating scale.

The Results of Paired t test reveals that there is significant decrease in the level of restless leg syndrome at the level of $p<0.05$ in the experimental group. Independent t test reveals that there is significant difference in the level of restless leg syndrome at the level of $p<0.05$ between the experimental group and control group.

Mansooreh Aliasgharpour.et.al.,(2016) The study was conducted to assess the effect of stretching exercises on the severity of restless legs syndrome in patients on haemodialysis. This clinical trial study was conducted on 33 patients who had been identified using diagnostic criteria from the haemodialysis ward of Hasheminejad Hospital in Tehran. Participants were randomly divided into the intervention group (n = 17) and control group (n = 16). Stretching exercises were performed on legs during the dialysis for half an hour, three times a week for 8 weeks in intervention group. Data were collected by using the international restless legs syndrome study group scale. The results showed that the majority of participants were suffering from moderate restless legs syndrome. The symptom severity of this syndrome meaningfully changed eight weeks after intervention in the intervention group compared to the control group ($P < 0.001$).

Silva S.F, et al., (2013).A study to assess the physical therapy during haemodialysis in patients with chronic kidney disease was conducted .The therapy consists of muscle strengthening exercises, stretching and stationary exercises. Fifty six chronic kidney disease patients were participated. They underwent evaluation before the start of the program and after the training. The mean values of HR, RR, BP at the end of the test were 97.57 ± 16.82beats per minute 22.26 ± 2.46 breaths per minute and 133.43 ± 15.52 mmHg. The Borg Scale scores had a mean initial value of 0.97 ± 0.98 and a median of 0.50. After performing the exercises the mean value was 0.43 ± 0.47 and median value equal to the initial, 0.50 ($p < 0.001$). Thus there was a significant difference

between these scores and concluded that there is an improvement in the quality of life and physical ability of patients with chronic kidney disease.

Moeinzadeh F.et.al.,(2017) This study aimed to investigate the effects of two methods of reflexology and stretching exercises on the severity of restless leg syndrome among patients undergoing haemodialysis. This study is a randomized clinical trial that was done on 90 qualified patients undergoing haemodialysis in selected hospitals of Isfahan, who were diagnosed with restless leg syndrome through standard restless leg syndrome questionnaire. The results that there was a significant difference in the mean scores of restless leg syndrome severity between reflexology and stretching exercises groups, compared to control ($P < 0.001$), but there was no significant difference between the two study groups ($P < 0.001$). Changes in the mean score of restless leg syndrome severity were significantly higher in reflexology and stretching exercises groups compared to the control group ($P < 0.001$), but it showed no significant difference between reflexology massage and stretching exercises groups.

Section E: STUDIES RELATED TO EFFECTIVENESS OF STRETCHING EXERCISES ON FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE.

Maniam et.al.,(2014) conducted a study aimed to determine the effectiveness of a predialysis low-to-moderate-intensity exercise programme for reducing fatigue and improving sleep disorders among long-term haemodialysis patients.In this quasi-experimental study, an exercise programme was conducted three times a week for 12 weeks before long-term haemodialysis patients underwent dialysis at two centers. The patients were categorized into either the exercise group ($n = 28$) or control group ($n = 27$). The latter was asked to maintain their current lifestyles. Assessments of fatigue and sleep disorder levels were performed for both groups using self-reported

questionnaires at baseline and after intervention. The patients' perception of the exercise programme was also determined using self-reported questionnaires. Paired sample *t*-test indicated improvements in fatigue level in the exercise group (mean fatigue score: post-treatment 40.5 ± 7.9 vs. pre-treatment 30.0 ± 10.9).

Veeram Reddy Thejaswi et.al., (2016) A study was conducted to assess the effectiveness of Leg stretch exercises on fatigue among patients undergoing haemodialysis. A total of 60 samples were selected by using non probability convenience sampling technique. The findings of the study revealed that effectiveness of leg stretch exercises on fatigue among patients undergoing haemodialysis, in experimental group, during pretest, 16(53%) had mild fatigue whereas in posttest, 5(17%) had mild fatigue. In pretest, 17(57%) had moderate fatigue whereas in posttest, 12(40%) had moderate fatigue. In pretest, 8(26%) had severe fatigue whereas in posttest, 2(7%) had severe fatigue. In experimental group the posttest mean is 27.5 with standard deviation of 9.74 where as in control group the mean is 35.4 with standard deviation of15.3. The calculated value is 2.20 is greater than the tabulated value 1.69. The study concludes that the Leg stretching exercises are effective in reducing the fatigue levels.

Chang Y et.al.,(2010) This study was conducted to evaluate the effect of intradialytic leg ergometry exercise for improving fatigue and daily physical activity levels among chronic kidney disease patients. A quasi-experimental clinical trial. Two haemodialysis units in a medical center in northern Taiwan. The leg ergometry exercise was performed within the first hour of each haemodialysis session for 30 min for 8 weeks. There were 36 subjects in the experimental group and 35 subjects in the control group who completed the study. Measurement on a fatigue scale and a physical activity log were done at the time of enrollment, and again on the fourth and eighth weeks. The results of

the study concluded that active subjects demonstrated significantly less fatigue and higher physical activity levels than those with a sedentary lifestyle at baseline. During the 8 weeks of intervention, subjects in both the active and sedentary groups reduced their fatigue levels significantly, with the exception of sedentary subjects in the control group. Only active subjects in the experimental group demonstrated an increase in activity levels. The 36 subjects performed 3456 leg ergometry exercise sessions with three early terminations (<.01%) among the sedentary subjects.

CHAPTER –III

METHODOLOGY

RESEARCH APPROACH

An evaluative approach was selected for this study.

RESEARCH DESIGN

The research design adopted for the present study was Quasi experimental non equivalent control group pretest posttest design.

SCHEMATIC REPRESENTATION

GROUPS	PRETEST	INTERVENTION	POSTTEST
Experimental group	O_1	X	O_2
Control group	O_1	-	O_2

O_1: Demographic variables and pretest to assess the level of severity of restless legs syndrome and fatigue among patients with chronic renal failure in experimental and control group

X: Intervention of stretching exercises, twice a day (one hour before and one hour after haemodialysis individually for 30 minutes for 15 days among patients with chronic renal failure in experimental group.

O_2: Posttest to assess the level of severity of restless legs syndrome and fatigue among patients with chronic renal failure in experimental group and control group.

SETTING OF THE STUDY

The study was conducted at Nallaswamy kidney center and Maaruti medical center, Erode.

In Erode kidney centre, Nallaswamy kidney center, it is 65 bedded hospital with various departments like general medicine, surgery, gynaecology, orthopaedics, psychiatrics and department of urology. Number of outpatients treated in this hospital were 200 per day and number of inpatients were 60. Every day 10-15 patients of renal failure were treated in Inpatient department, 40 patients were getting haemodialysis every day, and 200 patients were getting haemodialysis per month. 30 chronic renal failure patients undergoing haemodialysis were selected for this study in experimental group.

Maaruthi medical centre and hospital, Erode, it is a 50 bedded hospital with various departments like general medicine, gynaecology, urology, nephrology, department of advanced kidney stone removal surgery and advanced dialysis unit. Number of outpatients treated in this hospital were 100 per day and number of Inpatients treated were 40. Every day 10-12 patients of renal failure were treated in inpatient department, 20 patients were getting haemodialysis every day, and 150 patients were getting haemodialysis per month. 30 chronic renal failure patients undergoing haemodialysis were selected for this study in control group.

POPULATION

The study population consists of patients with chronic renal failure.

SAMPLE

Patients with chronic renal failure and who are undergoing haemodialysis admitted in nephrology ward with minimum stay of 16 days.

CRITERIA FOR SELECTION OF SAMPLE

INCLUSION CRITERIA:

- Adults who are between the age group of 40-65 years
- Patients who are diagnosed/confirmed as restless legs syndrome with a screening scores of 5.
- Both male and female patients.
- Patients who are willing to participate in the study.
- Patients who are admitted in the nephrology ward with a minimum stay of 16 days.

EXCLUSION CRITERIA:

- Patients who are having any injuries in legs or vascular problems in legs and presence of any orthopedic problems.
- Patients who are physically challenged.
- Patients who are critically ill.

SAMPLE SIZE AND SAMPLING PROCEDURE

SAMPLE SIZE:

The sample size for this study consists of 60; 30 were in experimental group and 30 were in control group.

SAMPLING TECHNIQUE:

Non probability purposive sampling technique was used to select the samples for experimental and control group.

INSTRUMENT AND SCORING PROCEDURE

INSTRUMENT

The tool consists of four parts.

PART- I

It consists of demographic variables such as age, sex, marital status, education, occupation, family monthly income, duration of haemodialysis treatment.

PART-II

SCREENING TOOL

International Restless legs syndrome Study Group criteria for the diagnosis of restless legs syndrome was used to screen the patients for restless legs syndrome. It consists of 5 Yes/No Questions. It is rated as Normal, and diagnosed/confirmed restless legs syndrome. The total score is 5.

PART-III

SEVERITY OF RESTLESS LEGS SYNDROME:

Walter's International Restless legs syndrome Study Group Rating Scale was used to assess the level of restless legs syndrome. It consists of 10 questions, each with 5 options and scored as 0,1,2,3,4. The total score is 40.

PART-IV

FATIGUE ASSESSMENT SCALE

Helen Michielsen fatigue assessment scale was used to assess the level of fatigue among patients with chronic renal failure. It consists of 10 statements. It is rated as never, sometimes, regularly, often, always and scored

as 1,2,3,4,5. The total score is 50 and it has reverse scores for the questions 4 and 10.

SCORING PROCEDURE

PART – III

SEVERITY OF RESTLESS LEGS SYNDROME:

Walter's International Restless legs syndrome Study Group Rating Scale was used to assess the level of restless legs syndrome, Scores were interpreted as follows

LEVEL OF SEVERITY OF RESTLESS LEGS SYNDROME	SCORE	PERCENTAGE (%)
Normal	0	0
Mild	1-10	1-25%
Moderate	11-20	26-50%
Severe	21-30	51-75%
Very Severe	31-40	76-100%

PART-IV

Helen Michielsen fatigue assessment scale was used to assess the level of fatigue and its scores were interpreted as follows

LEVEL OF FATIGUE	SCORE	PERCENTAGE (%)
Normal (Never)	1 -10	0 – 20
Mild fatigue (Sometimes)	11-20	21 -40
Moderate fatigue (Regularly)	21-30	41 – 60
Severe fatigue (Often)	31-40	61 -80
Extreme fatigue (Always)	41 -50	81 -100

VALIDITY AND RELIABILITY OF THE TOOL

VALIDITY:

The content validity of the tool was established in consultation with 1 medical expert and 3 nursing experts in the field of medical surgical nursing and nephrologist.

RELIABILITY

The reliability of the International restless legs syndrome was established by testing the internal consistency by using Cronbach's alpha formula and it was found to be reliable (r= 0.93). The reliability of the fatigue assessment scale was established by testing the internal consistency by using Karl pearson's formula and it was found to be reliable (r= 0.83).

PILOT STUDY

Pilot study was conducted in Kalyani kidney center, Erode. The researcher obtained written permission from the institution and oral permission from the participants prior to the study, the purpose of the study was explained to the subjects. The pilot study was conducted for a period of 15 days. Patients fulfilling the inclusion criteria were selected by using purposive sampling technique. The patients who scored 5 as per the International Restless legs syndrome Study Group criteria were selected. The Sample size for this study was 10, out of which 5 were in experimental group and 5 were in control group. On the first day, data pertaining to the demographic variables were collected by structured interview method then the pretest was conducted by using International restless legs syndrome scale, and fatigue assessment scale in both the group. On first day onwards stretching exercises were given to the experimental group individually for 30 minutes one hour before haemodialysis and one hour after haemodialysis and continued for 15 days. On the 15^{th} day

posttest was conducted for the experimental and control group by using the same scales.

Findings of the pilot study revealed that, for experimental group, the mean posttest score of restless legs syndrome 18.6(SD± 2.5) was less than the mean pretest scores of restless legs syndrome 25.8 (SD± 2.06). The paired 't' test value for restless legs syndrome in experimental group was 6.48 (table value=2.778) at $p<0.05$ level of significance and the mean posttest fatigue scores 19.2 (SD±2.16) is less than the pretest score 31.4(SD±5.22) in experimental group. The paired 't' test value for fatigue in experimental group was 3.37 (table value=2.776) at $p<0.05$ level of significance. Independent 't' value for restless legs syndrome was 5.59 (table value=2.78) at $P<0.05$ level of significance showed that there was a significant reduction in the restless legs syndrome between experimental and control group. Independent 't' value for fatigue was 14.0 (table value=2.78) at $P<0.05$ level of significance showed that there was a significant reduction in the fatigue between experimental group and control group. Results of the pilot study revealed that the study is feasible and practicable to conduct the main study.

DATA COLLECTION PROCEDURE

The main study was conducted in Nallaswamy kidney center and Maaruti medical centre at Erode. The data collection period was 6 weeks. The investigator obtained written permission from both the kidney centers and oral consent was obtained from each participants prior to the study. The purpose of the study were explained to the subjects. Samples who were fulfilling the inclusion criteria were selected by using purposive sampling technique. In experimental group, 30 samples were selected from Nallaswamy kidney centre, in control group 30 samples were selected from Maaruti medical centre, Erode. Distance between both hospitals is 1.5kilometerss. Patients were divided in to 3 groups. On the first day screening was done by using International restless legs

syndrome study group diagnostic criteria for diagnosing the restless legs syndrome and 10 samples who scored 5 were selected for experimental group and 10 samples for control group and data pertaining to the demographic variables were collected by interview method and then the pretest was conducted to the participants by using International Restless legs syndrome study group rating scale and fatigue assessment scale by structured interview schedule in both groups. From the first day onwards stretching exercises which includes hip rotation to the sides, quadriceps stretch, knee-to-chest stretch, hamstring stretch, straight leg raise, gluteal stretch, side lying leg lift were taught to the participants in the experimental group individually by the researcher using laptop and from next day onwards made them to do the exercises individually for 30 minutes by seeing the flash cards which was carried out one hour before and one hour after haemodialysis and continued for a period of 15 days. On the 15^{th} day, posttest was conducted for the experimental and control group by using the same scale. The same procedure was continued for the other 2 groups. The collected data were analyzed and tabulated using descriptive and inferential statistics.

PLAN FOR DATA ANALYSIS

The data were analyzed by using descriptive and inferential statistics. The statistical methods using to analyze the data were as follows,

DATA ANALYSIS	METHOD	PURPOSE
Descriptive statistics	Frequency, Percentage Mean, and Standard Deviation	• To describe the demographic variables among patients chronic renal failure in experimental group and control group. • To assess the pretest level of severity of Restless legs syndromeand fatigue among patients with chronic renal failure in experimental group and control group. • To assess the posttest level of Restless legs syndromeand fatigue among patients with chronic renal failure in experimental group and control group
Inferential statistics	Paired 't' test	• To compare pre and posttest level of Restless legs syndrome among patients with chronic renal failure in experimental group. • To compare pre and posttest level of fatigue among patients with chronic renal failure in experimental group.
	Independent 't' test	• To find out the effectiveness of Stretching exercises on reduction of severity of restless legs syndrome among patients with chronic renal failure between experimental group and

	Chi- square test	control group. • To find out the effectiveness of stretching exercises on fatigue among patients with chronic renal failure between experimental group and control group. • To find out the association between posttest level of Restless legs syndrome among patients with chronic renal failure and their selected demographic variables in experimental group. • To find out the association between the post level of fatigue among patients with chronic renal failure and their selected demographic variables in experimental group.

PROTECTING THE HUMAN SUBJECTS

The research proposal was approved by the ethical committee prior to the conduction of pilot study and main study. The written permission was obtained from the medical superintendents of both kidney centers at Erode. Oral consent was obtained from each subject before starting the data collection and privacy was provided while performing the exercises.

CHAPTER-IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the description of sample characteristics, analysis and interpretation of the data collection to evaluate the effectiveness of stretching exercise on reduction of restless legs syndrome and fatigue among patients with chronic renal failure patients in Nallaswamy kidney center and Maaruti medical center, at Erode.

ORGANIZATION DATA

The data has been organized and tabulated as follows;

SECTION A: Distribution of demographic variables of patients with chronic renal failure in experimental and control group.

SECTION B : Assess the pretest and posttest level of severity of restless legs syndrome and fatigue among patients with chronic renal failure in experimental and control group.

SECTION C: To compare the pretest and posttest level of severity of restless legs syndrome among patients with chronic renal failure in experimental group

SECTION D: To compare the pretest and posttest level of fatigue among patients with chronic renal failure in experimental group.

SECTION E : Evaluate the effectiveness of stretching exercises on severity of restless legs syndrome among patients

with chronic renal failure between experimental and control group

SECTION F : Evaluate the effectiveness of stretching exercises on fatigue among patients with chronic renal failure between experimental and control group.

SECTION G : Association between the mean posttest level of restless legs syndrome among patients with chronic renal failure and their selected demographic variables in experimental group.

SECTION H : Association between the mean posttest level of fatigue among patients with chronic renal failure and their selected demographic variables in experimental group.

SECTION A: Distribution of demographic variables of patients with chronic renal failure experimental and control group.

TABLE 1: Frequency and percentage distribution of demographic variables among patients with chronic renal failure in experimental and control group.

$n_1 = 30, n_2 = 30$

S. No	DEMOGRAPHIC VARIABLES	EXPERIMENTAL GROUP		CONTROL GROUP	
		F	%	F	%
1	**Age(in years)**				
1.1	40-45 Years	5	16.7	5	16.7
1.2	46-52 years	10	33.3	8	26.6
1.3	53-59 years	11	36.7	15	50
1.4	60-65 years	4	13.3	2	6.7
2.	**Sex**				
2.1	Male	12	40	11	36.7
2.2	Female	18	60	19	63.3
3.	**Marital Status**				
3.1	Married	19	63.3	24	80
3.2	Unmarried	7	23.4	4	13.3
3.3	Widow	3	10	2	6.7
3.4	Divorce	1	3.3	-	-
4.	**Education**				
4.1	No formal education	8	26.7	5	16.7
4.2	Primary education	6	20	11	36.7
4.3	High school education	7	23.3	3	10
4.4	Higher secondary education	8	26.7	8	26.6
4.5	Graduates	1	3.3	3	10

S. No	DEMOGRAPHIC VARIABLES	EXPERIMENTAL GROUP		CONTROL GROUP	
		F	%	F	%
5.	**Occupation**				
5.1	Self employed	10	33.3	5	16.7
5.2	Government employee	2	6.7	2	6.7
5.3	Unemployed	7	23.3	19	63.3
5.4	Private employee	11	36.7	4	13.3
6.	**Familymonthly Income**				
6.1	Rs.10,000-15,000/-	14	46.6	7	23.3
6.2	Rs.15,000-20,000/-	10	33.3	17	56.7
6.3	Rs.20,000-25,000/-	2	6.7	4	13.3
6.4	Above 25,000/-	4	13.4	2	6.7
7.	**Duration of illness**				
7.1	0-6 months	1	3.3	5	16.7
7.2	7 months -3 years	13	43.3	16	53.3
7.3	3 -5years	12	40	7	23.3
7.4	Above 5 years	4	13.4	2	6.7
8.	**Duration of getting haemodialysis treatment**				
8.1	0-6 months	1	3.3	10	33.3
8.2	7 months -1 year	2	6.7	5	16.7
8.3	1 year- 1 ½ years	10	33.3	5	16.7
8.4	1 ½ years-2 years	13	43.3	1	3.3
8.5	Above 2 years	4	13.4	9	30

Table 1 showed that the distribution of demographic variables among patients with chronic renal failure such as age, sex, marital status, education, occupation, family monthly income, duration of illness, duration of getting haemodialysis treatment**. (fig 1)**

Regarding age majority of patients with chronic renal failure are 11 (36.7%) belongs to the age group of 53-59 years, 10(33.3%) belongs to the age group of 46-52 years, 5(16.7%) belongs to the age group of 40-45 years, 4(13.3%) belongs to the age group of 60-65 years. In control group, majority of patients 15(50%) belongs to the age group of 53-59 years, 8(26.6%) belongs to the age group of 46-52 years, 5(16.7%) belongs to the age group of 40-45 years and 2(6.7%) belongs to the age group of 60-65years.(**fig 2**)

Regarding sex in experimental group majority of patients18(60%) were females, 12(40%) were males. (**fig 3A**) In control group majority of patients 19 (63.3%) were females, 11(36.7%) were males. (**fig 3B**)

Regarding marital status in experimental group, majority of patients 19(63.3%) were married, 7(23.4%) were unmarried, 3(10%) were widow, 1(3.3%) was divorced. In control group, majority of patients 24(80%) were married, 4(13.3%) were unmarried, 2(6.7%) were widow (**fig 4**)

Regarding education in experimental group, majority, 8(26.7%) had no formal education, 8(26.7%) had higher secondary education, 7(23.3%) had high school education, 6(20%) had primary education and 1(3.3%) was a graduate. In control group majority of patients 11(36.7%) had primary education, 8(26.6%) had higher secondary education, 5(16.7%) had no formal education, 3(10%) had high school education and 3(10%) were graduates. (**fig 5**)

Regarding occupational status in experimental group, majority 11(36.7%) were private employee, 10(33.3%) were self employed, 7(23.3%) were unemployed, 2(6.7%) was government employee. In control group, majority 19(63.3%) were unemployed, 5(16.7%) were self employed and 4(13.3%) were private employee, 2(6.7%) was government employee. (**fig 6**)

Regarding family monthly income in experimental group, majority 14(46.6%) had an income between Rs.10,000-Rs.15,000, 10(33.3%) had an

income between Rs.15,000-Rs.20,000, 4(13.4%) had an incomeof above 25,000, 2(6.7%) had an income between Rs.20,000-Rs.25,000. In control group, majority 17(56.7%) had an income between Rs.15,000-20,000, 7(23.3%) had an income between Rs.10,000-15,000, 4(13.3%) had an income between Rs.20,000-25,000, 2(6.7%) had an income of above Rs.25,000.(**fig 7**)

Regarding duration of illness, in experimental group majority of the patients with chronic renal failure 13(43.3%) had duration of illness between 7 months-3 years, 12(40%) had duration of illness between3 to 5 years and 4(13.4%) had duration of illness for above 5 years, 1(3.3%) had duration of illness between 0-6 months. In control group majority 16(53.3%) had duration of illness between 7 months to 3 years, 7(23.3%) had duration of illness for 3 to 5 years, 5(16.7%) had duration of illness for 0-6 months and 2(6.7%) had the illness for above 5 years. (**fig 8**)

Regarding duration of getting haemodialysis treatment, in experimental group majority 13(43.3%) had duration of treatment for 1 ½ years to 2 years, 10(33.3%) had duration of treatment for 1year to 1 ½ year and, 4(13.4%) had duration of treatment for above 2 years and 2(6.7%) had duration of treatment for 7months to 1 year, 1(3.3%) had duration of treatment for 0-6 months. In control group majority 10(33.3%)%) had duration of treatment for 0-6 months ,9(30%) had duration of treatment for above 2 years, 5(16.7%) had duration of treatment for 7months to 1 year, 5(16.7%) had the duration of treatment for1year to 1 ½ year, 1(3.3%) had the duration of treatment for 1 ½ years to 2 years (**fig 9**)

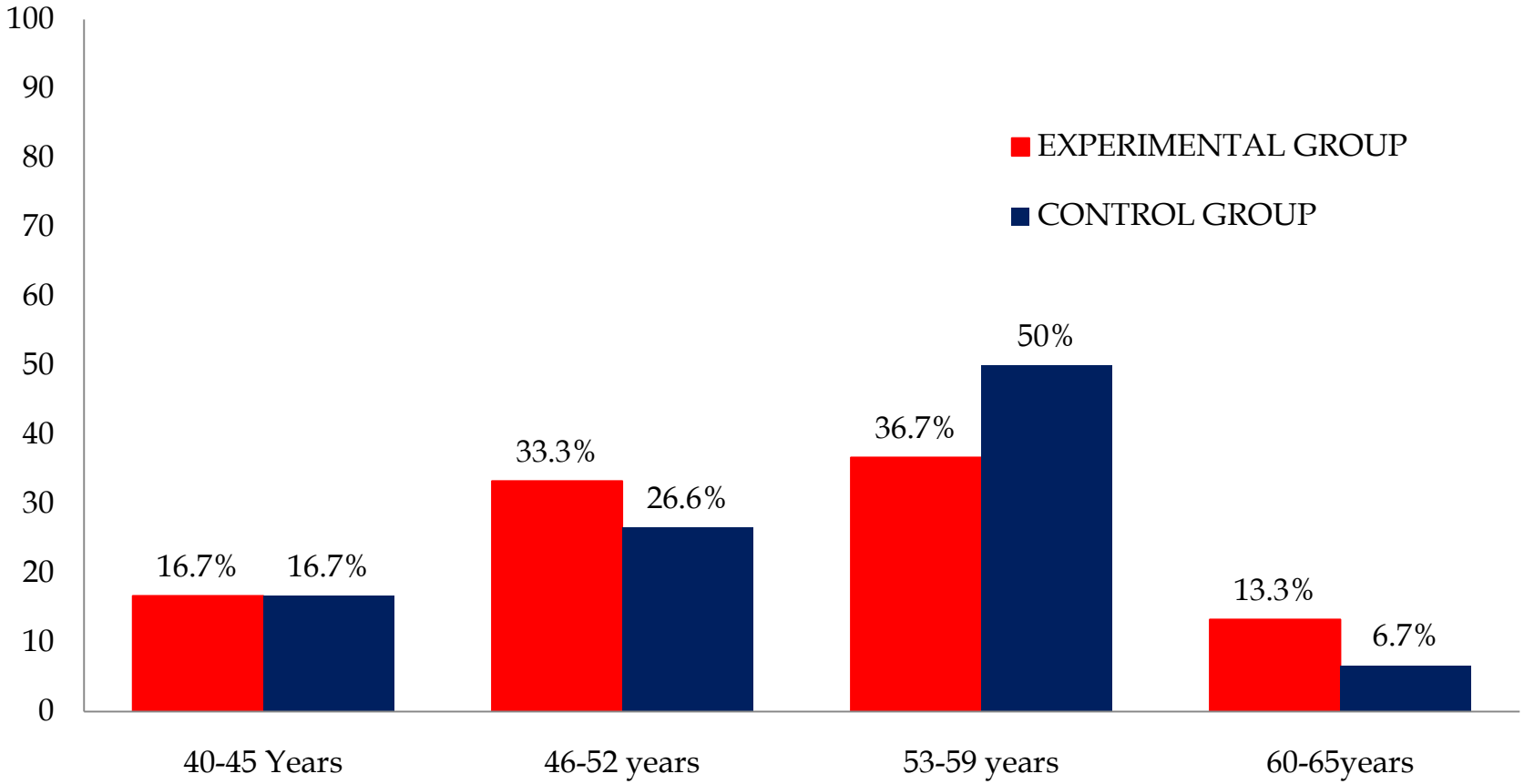
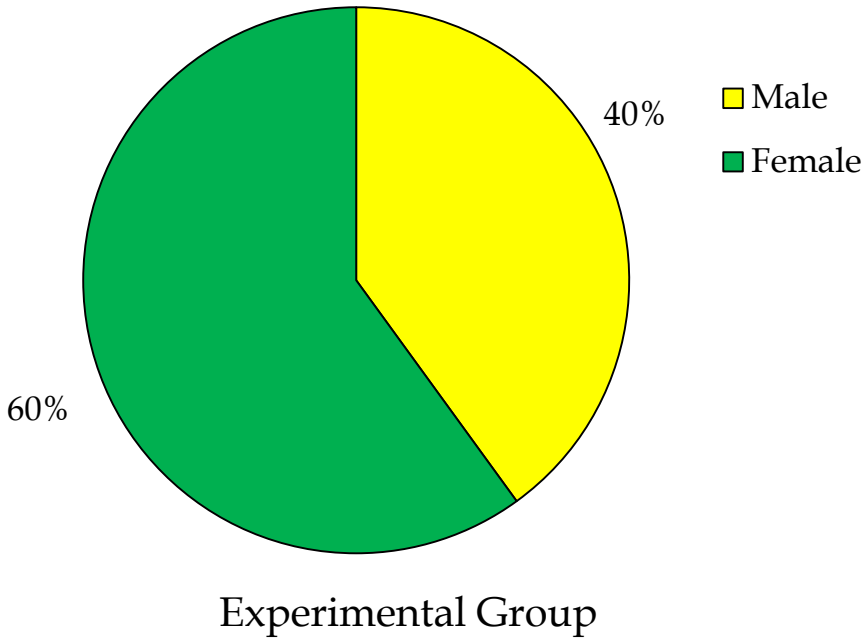
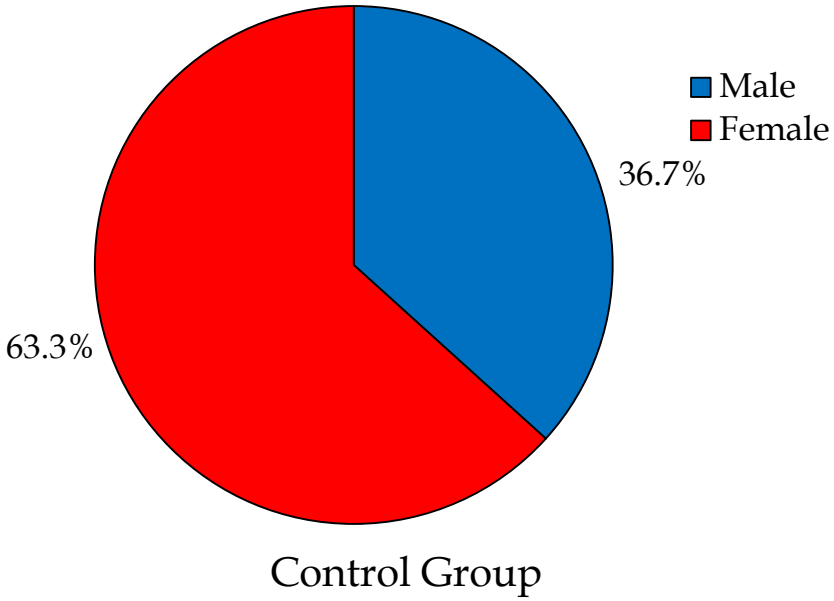


Fig 2 : Percentage distribution of patients with chronic renal failure according to their age in experimental and control group.





SEX

Fig :3 A and B Percentage distribution of patients with chronic renal failure according to their sex in experimental and control group.

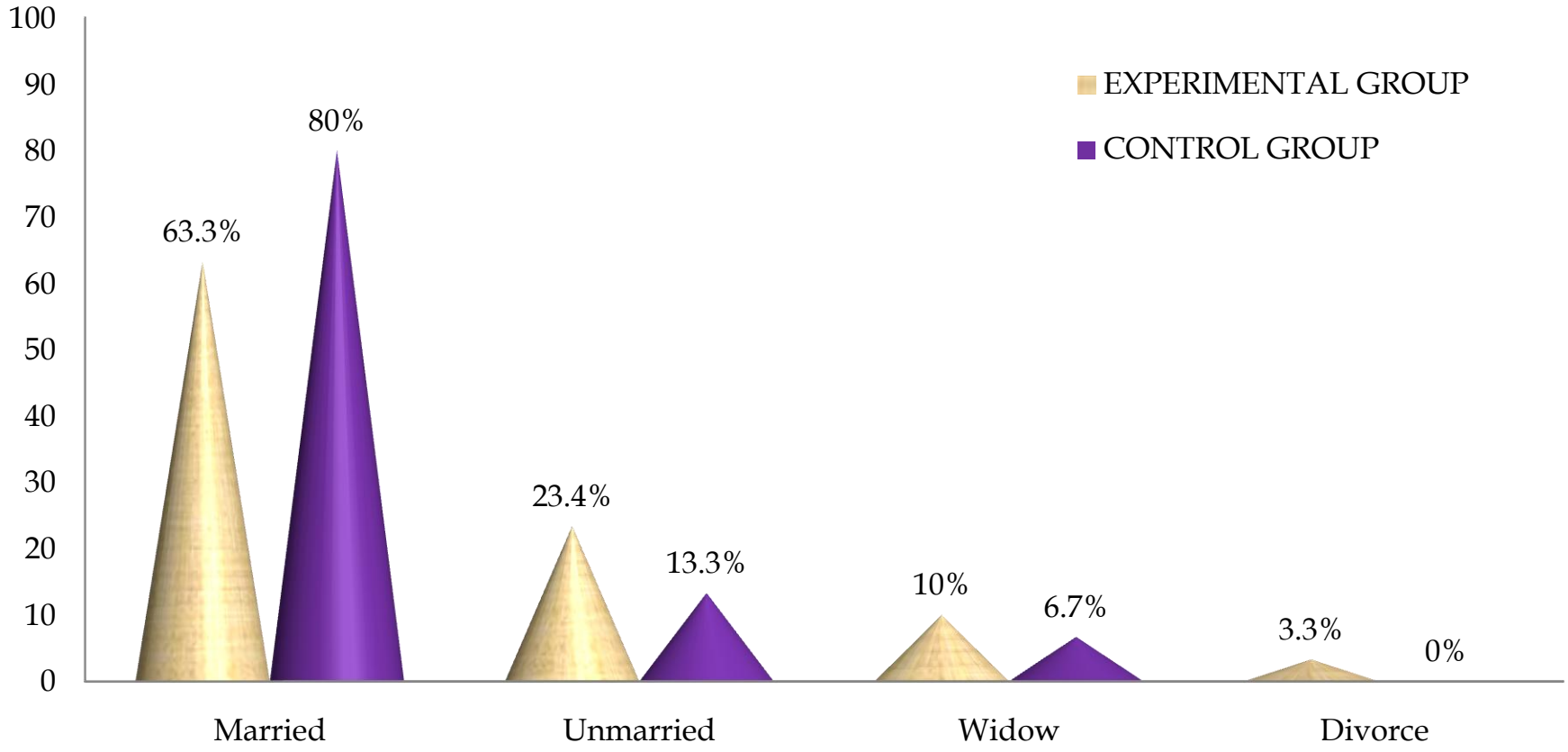


Fig 4 : Percentage distribution of patients with chronic renal failure according to their marital status in experimental and control group.

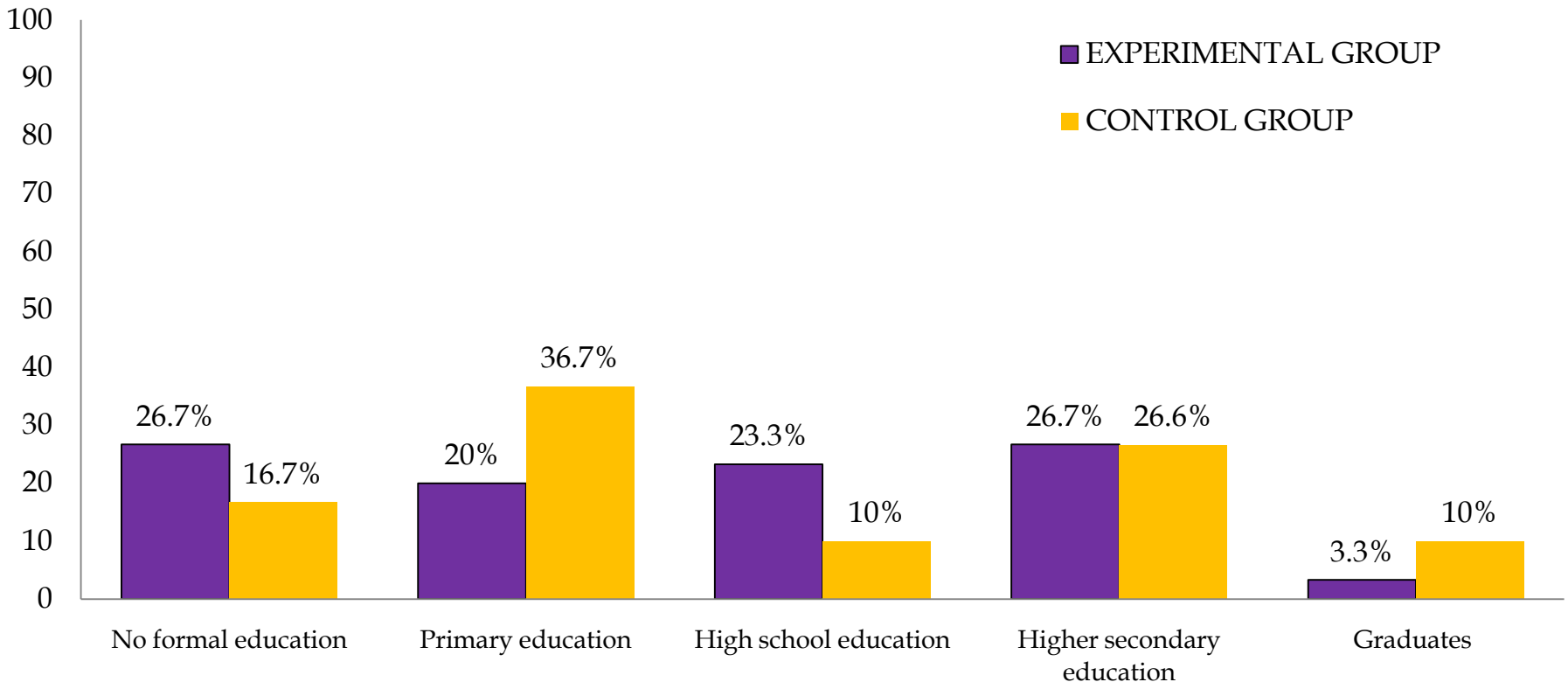


Fig 5 : Percentage distribution of patients with chronic renal failure according to their educational status in experimental and control group.

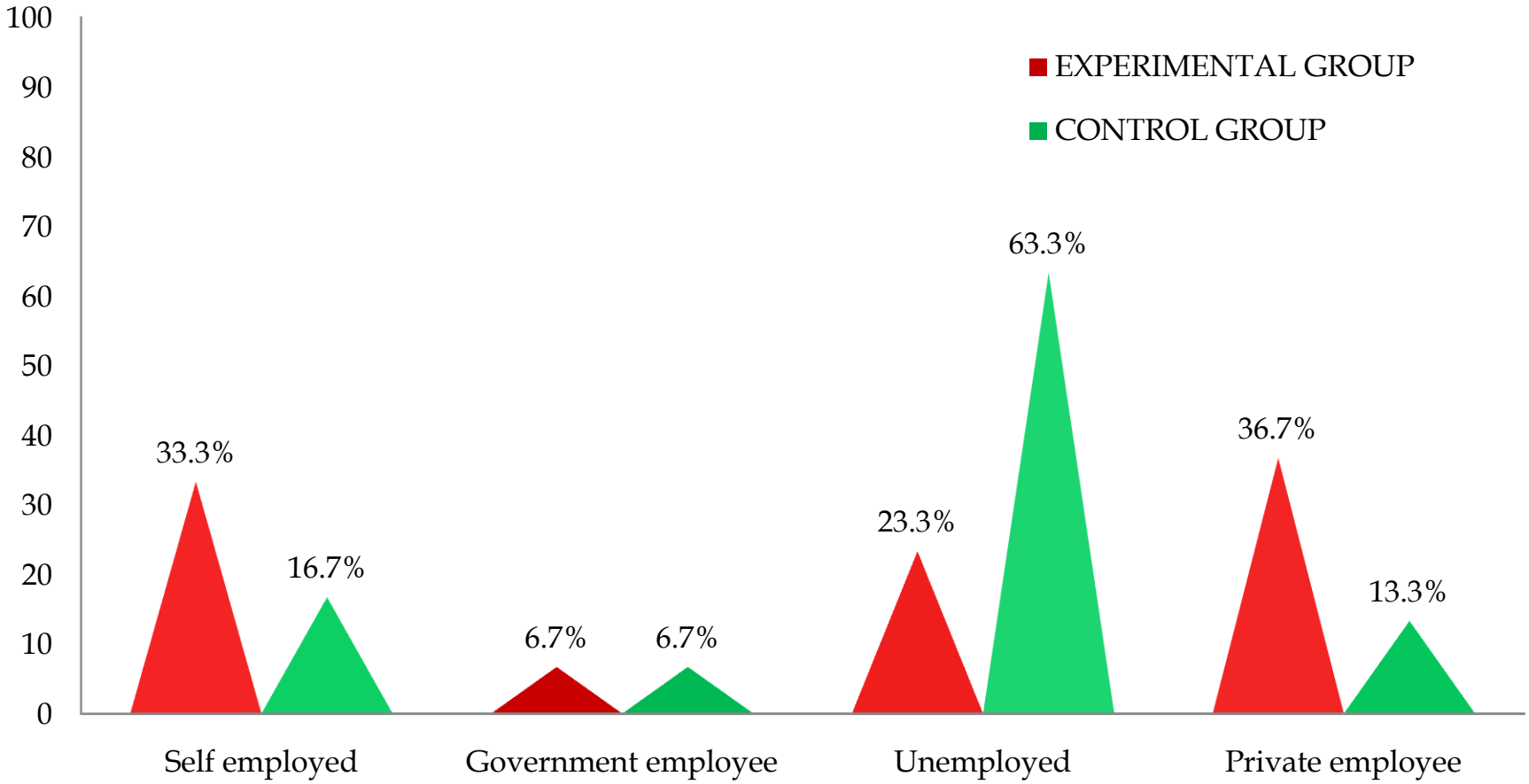


Fig 6 : Percentage distribution of patients with chronic renal failure according to their occupational status in experimental and control group.

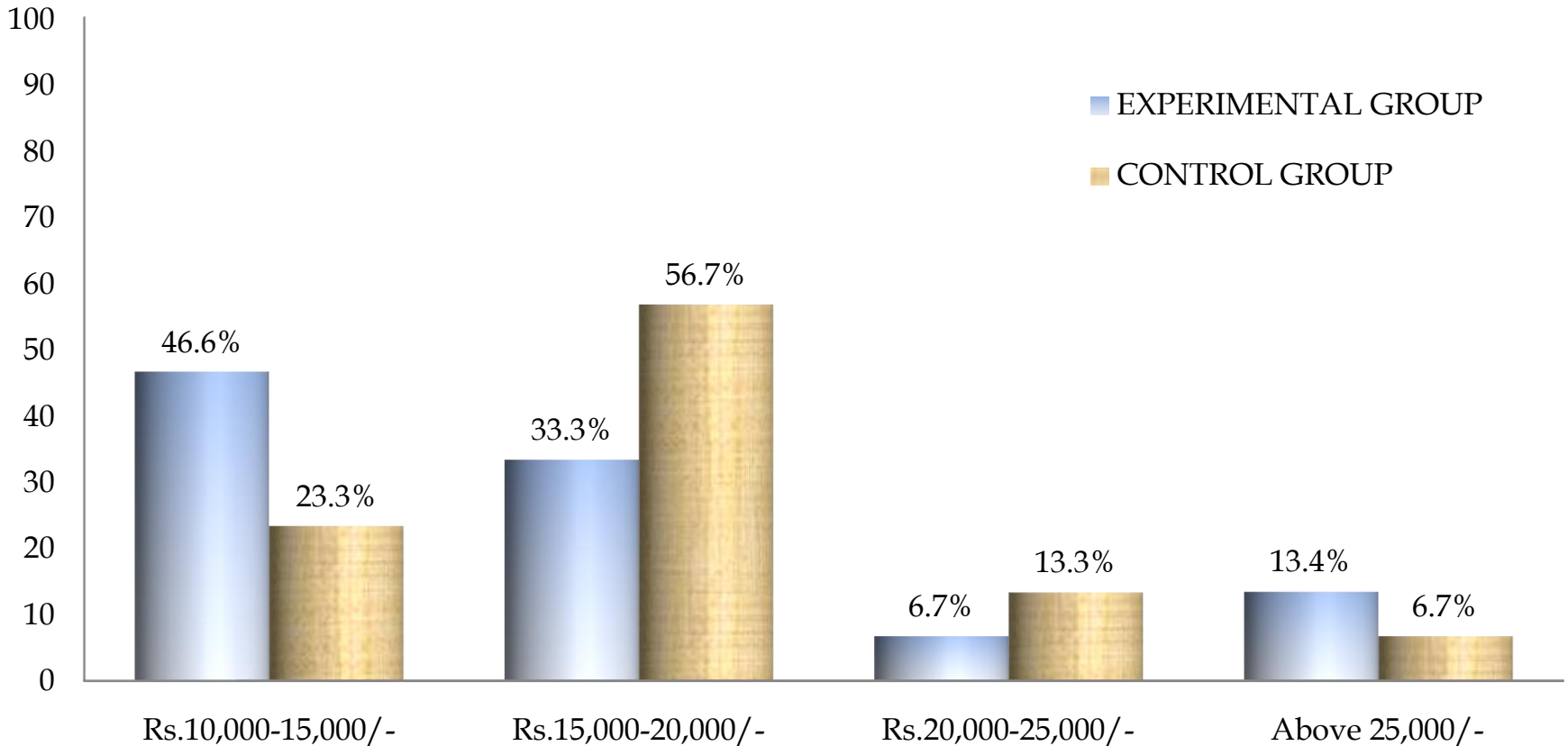


Fig 7 : Percentage distribution of patients with chronic renal failure according to their family monthly income in experimental and control group.

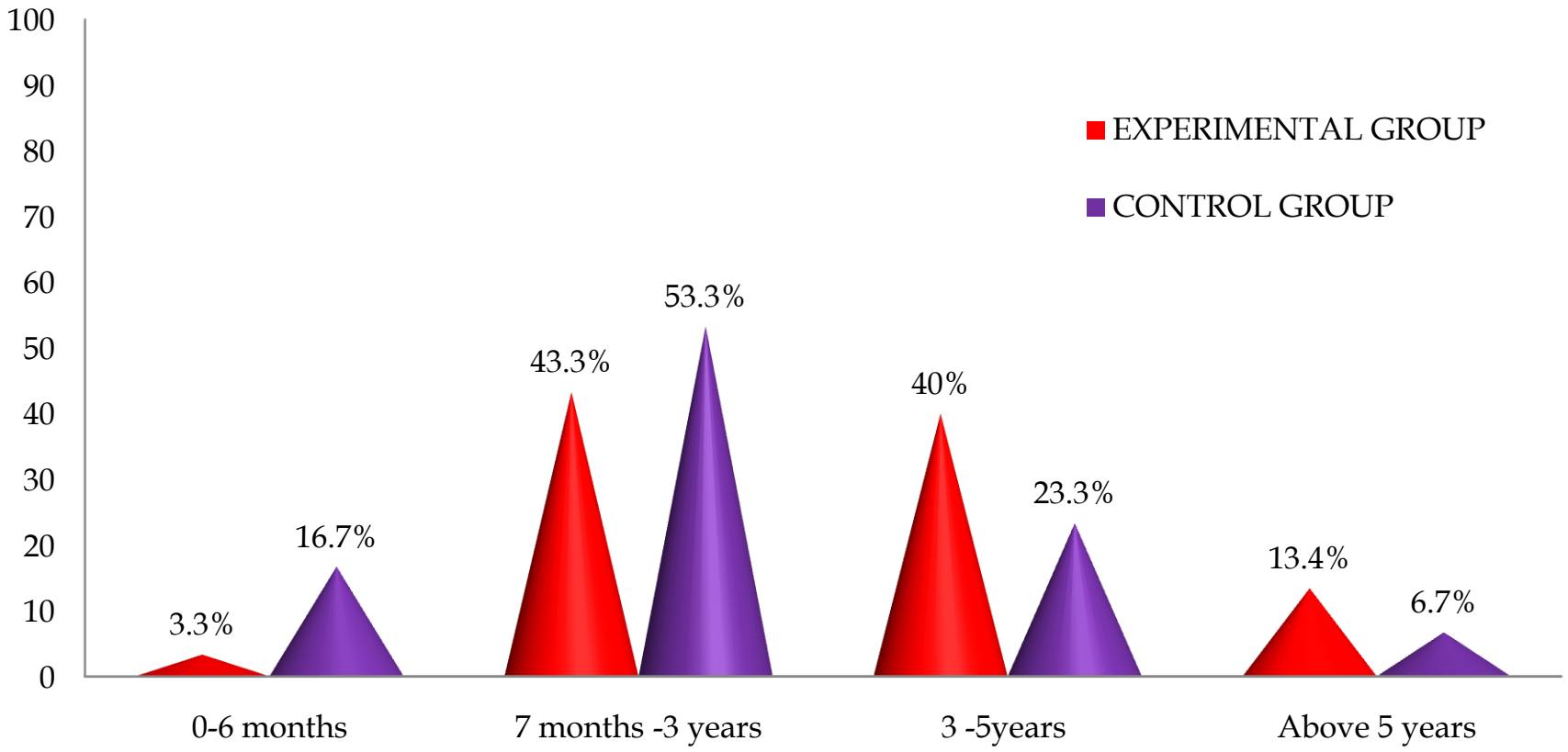


Fig 8 : Percentage distribution of patients with chronic renal failure according to their duration of illness in experimental and control group.

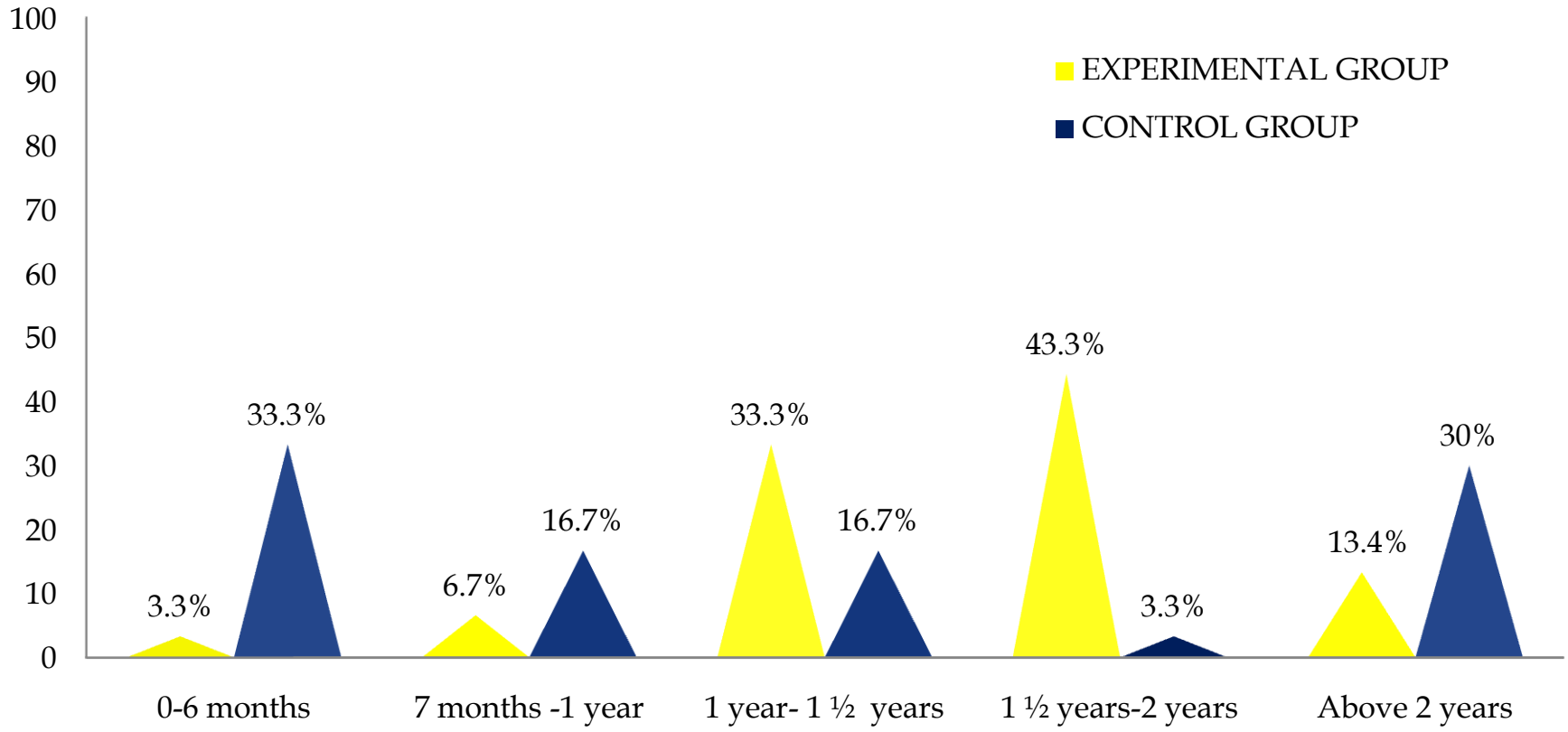


Fig 9: Percentage distribution of patients with chronic renal failure according to their duration of haemodialysis treatment in experimental and control group.

SECTION B : Assess the pretest level of restless legs syndrome and fatigue among patients with chronic renal failure in experimental and control group

TABLE 2: Frequency and percentage distribution of pretest level of restless legs syndrome among patients with chronic renal failure in experimental and control group

$n_1 = 30$, $n_2 = 30$

S.NO	LEVEL OF SEVERITY OF RESTLESS LEGS SYNDROME	EXPERIMENTAL GROUP		CONTROL GROUP	
		F	%	F	%
1.	Normal	-	-	-	-
2.	Mild	-	-	-	-
3.	Moderate	2	6.7	-	-
4.	Severe	23	76.6	25	83.3
5.	Very severe	5	16.7	5	16.7

Table 2 depicts that, in experimental group, in pre test majority 23(76.6%) had severe level of restless legs syndrome and 5(16.7%) had very severe level of restless legs syndrome and 2(6.7%) had moderate level of restless legs syndrome, where as in the control group 25(83.3%) of them had severe level of restless legs syndrome and 5(16.7%) had very severe level of restless legs syndrome. (**Fig 10**).

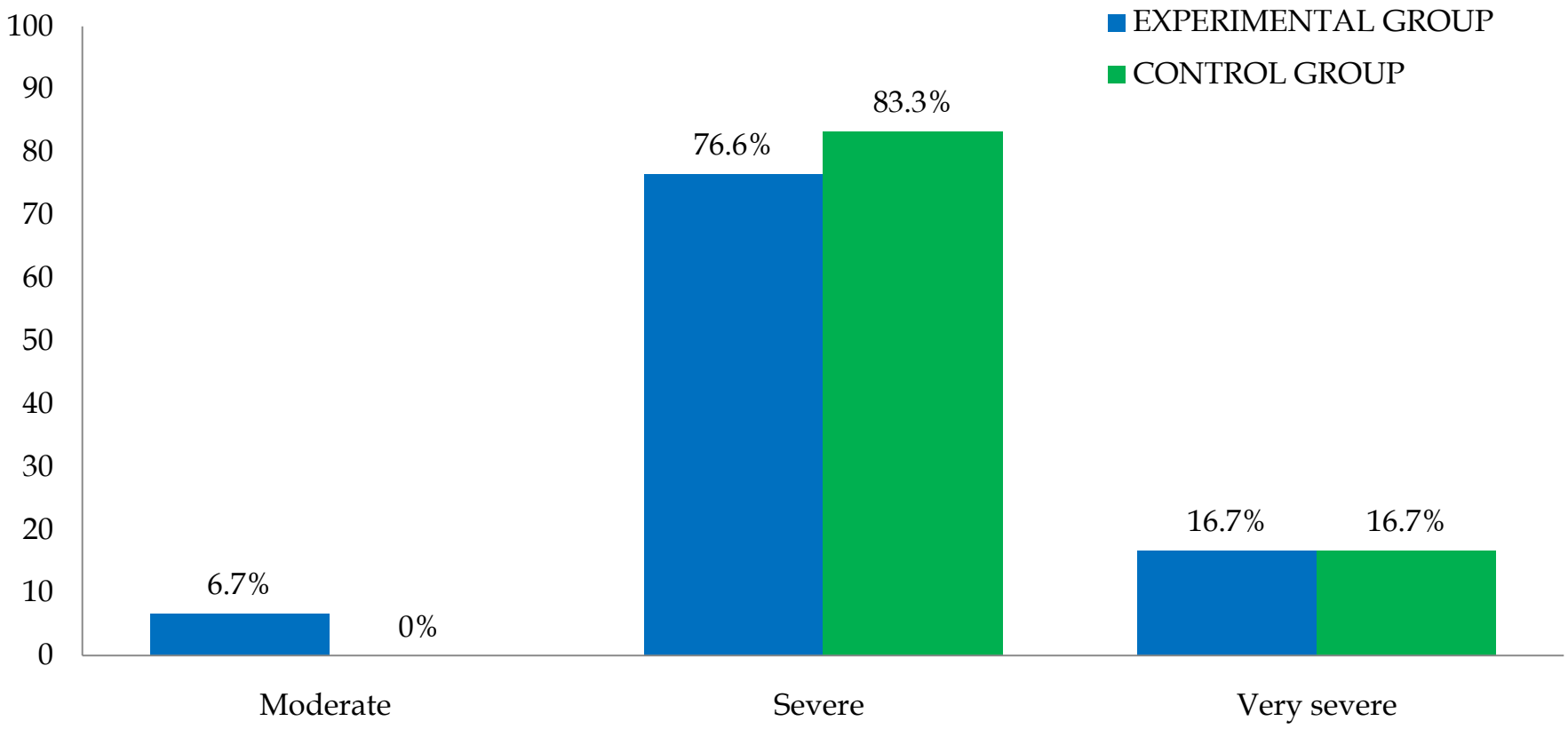


Fig 10 : Percentage distribution of pre test level of restless legs syndrome among patients with chronic renal failure in experimental and control group

TABLE :3 Frequency and percentage distribution of pretest level of fatigue among patients with chronic renal failure in Experimental and control group.

$n_1 = 30, n_2 = 30$

S.NO	LEVEL OF FATIGUE	EXPERIMENTAL GROUP		CONTROL GROUP	
		F	%	F	%
1.	Normal (None)	-	-	-	-
2.	Mild fatigue (Sometimes)	-	-	-	-
3.	Moderate fatigue (regularly)	9	30	16	53.3
4.	Severe fatigue (often)	17	56.7	14	46.7
5.	Extreme fatigue (always)	4	13.3	-	-

Table:3 Depicts that, In experimental group in pre test majority 17(56.7%) had severe level of fatigue and 9(30%) had moderate level of fatigue, 4(13.3%) had extreme level of fatigue, where as in the control group 16(53.3%) of them had moderate level of fatigue and 14(46.7%) had severe level of fatigue**.(fig.11)**

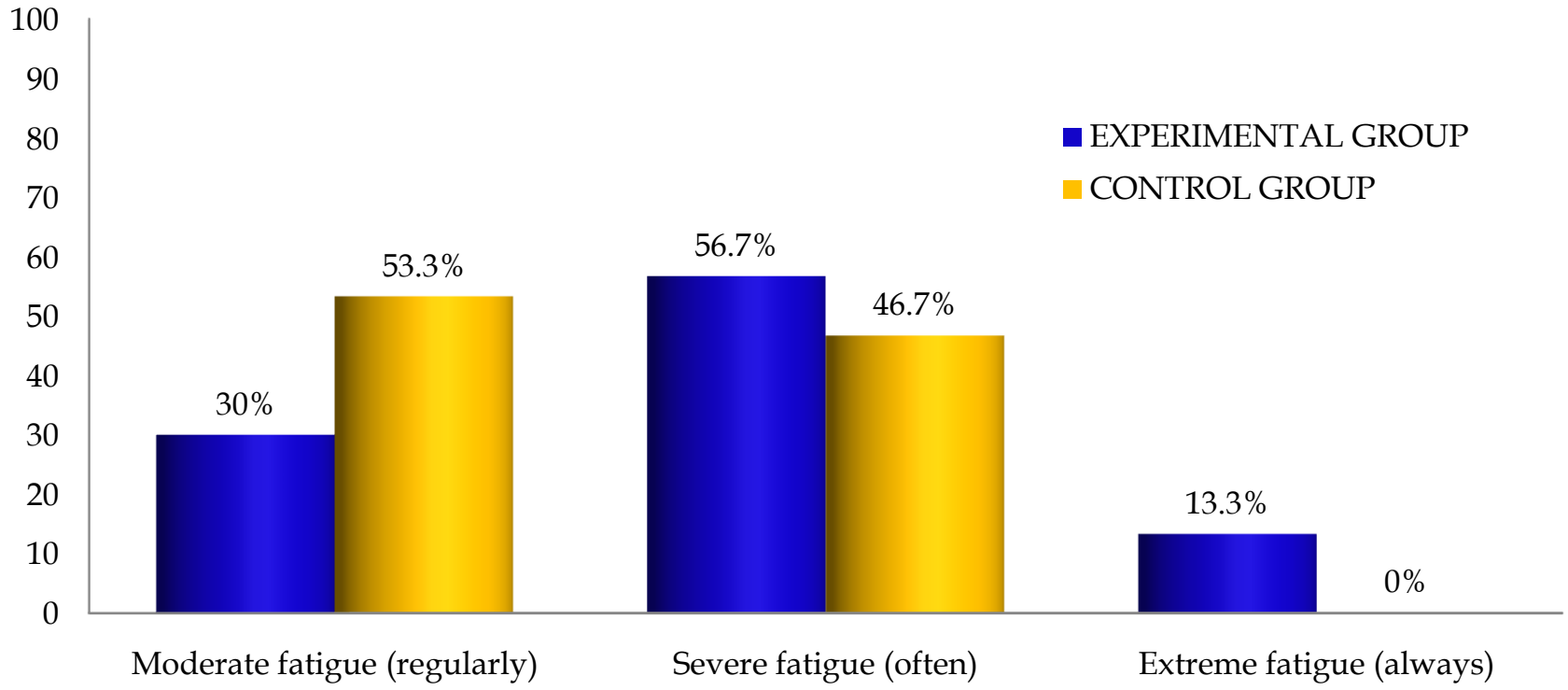


Fig 11 : Percentage distribution of pre test level of fatigue among patients with chronic renal failure in experimental and control group

SECTION C : Assess the posttest level of restless legs syndrome and fatigue among patients with chronic renal failure in experimental and control group

TABLE 4: Frequency and percentage distribution of posttest level of restless legs syndrome among patients with chronic renal failure in experimental and control group

$n_1 = 30$, $n_2 = 30$

S. NO	LEVEL OF SEVERITYRESTLESS LEGS SYNDROME	EXPERIMENTAL GROUP		CONTROL GROUP	
		f	%	F	%
1.	Normal	-	-	-	-
2.	Mild	-	-	-	-
3.	Moderate	26	86.7	-	-
4.	Severe	4	13.3	29	96.7
5.	Very severe	-	-	1	3.3

Table 4 depicts that, in experimental group, in posttest majority 26(86.7%) had moderate level of restless legs syndrome and 4(13.3%) had severe level of restless legs syndrome, where as in the control group 29(96.7%) of them had severe level of restless legs syndrome 1(3.3%) had very severe level of restless legs syndrome**. (fig.12)**

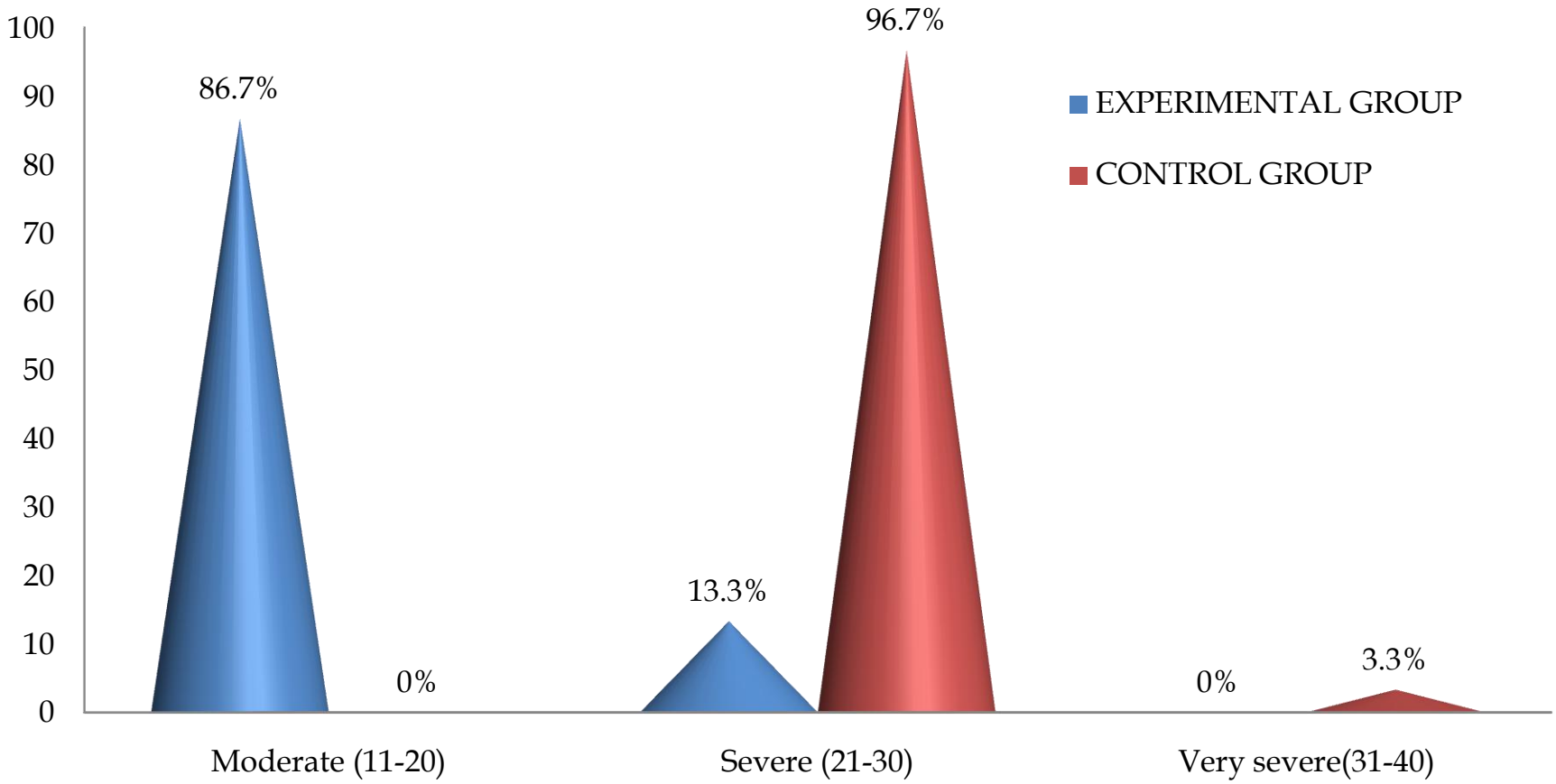


Fig 12 : Percentage distribution of posttest level of restless legs syndrome among patients with chronic renal failure in experimental and control group

TABLE 5: Frequency and percentage distribution of posttest level of fatigue among patients with chronic renal failure in experimental and control group:

$n_1 = 30$, $n_2 = 30$

S.NO	LEVEL OF FATIGUE	EXPERIMENTAL GROUP		CONTROL GROUP	
		f	%	F	%
1.	Normal (None)	-	-	-	-
2.	Mild fatigue (Sometimes)	27	90	-	-
3.	Moderate fatigue (Regularly)	3	10	1	3.3
4.	Severe fatigue (Often)	-	-	27	90
5.	Extreme fatigue (Always)	-	-	2	6.7

Table: 5 depicts that, in experimental group, in posttest majority 27(90%) had mild level of fatigue and 3(10%) had moderate level of fatigue, where as in the control group 27(90%) of them had severe level of fatigue and 1(3.3%) of them had moderate level of fatigue, 2(6.7%) of them had extreme level of fatigue**.(fig.13)**

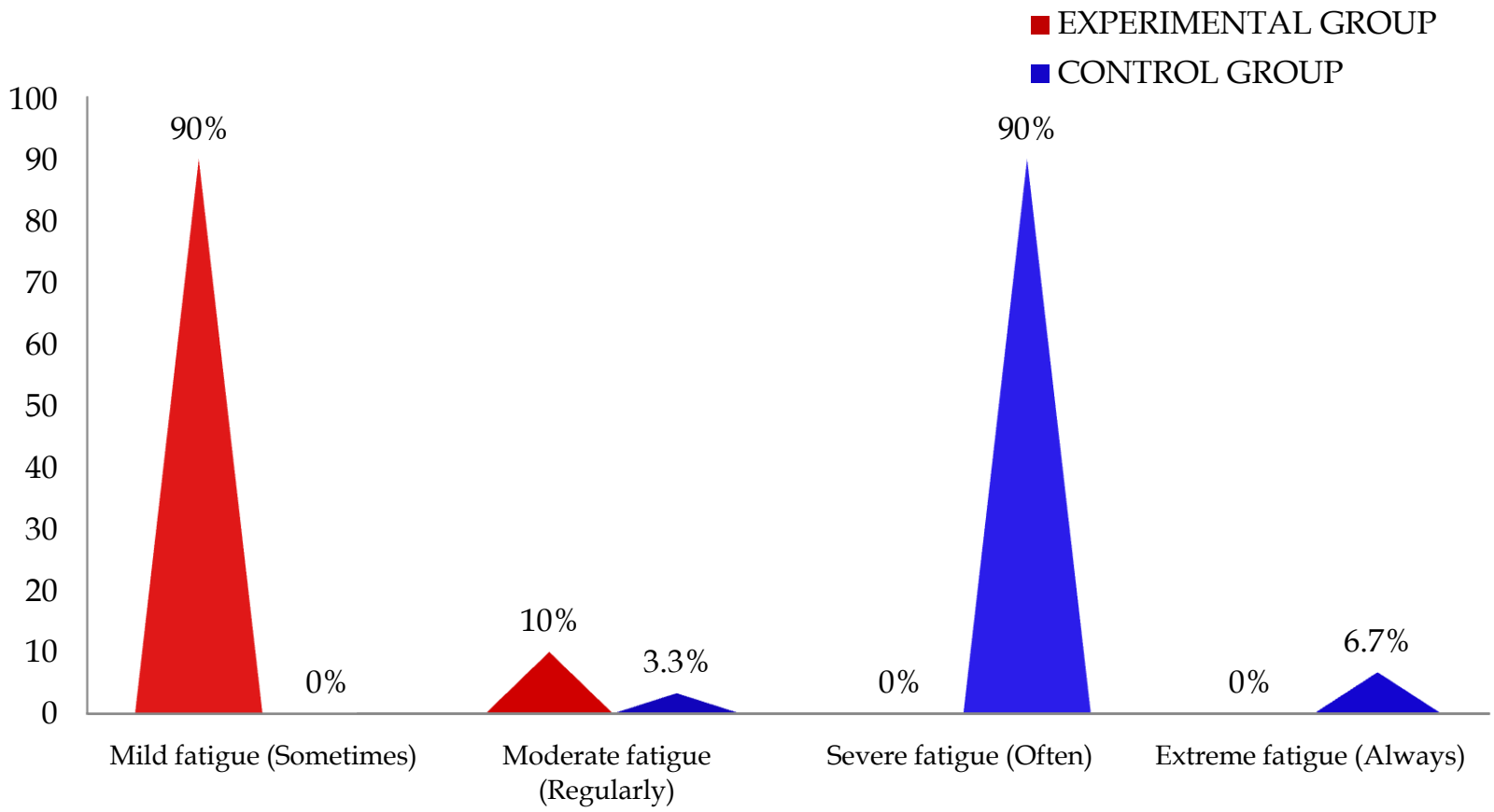


Fig 13 : Percentage distribution of posttest level of fatigue among patients with chronic renal failure in experimental and control group

SECTION D : Comparison between the pretest and posttest level of restless legs syndrome and fatigue among patients with chronic renal failure in experimental group.

TABLE 6: Comparison of mean, standard deviation, mean difference and paired 't' value of pretest and posttest level of restless legs syndrome among patients with chronic renal failure in experimental group.

n=30

S. No	Variable	Mean	Standard deviation	Mean difference	Paired 't' test	Table value	Inference
1.	Pretest	26	1.6	8.6	12.12	2.045	S
2.	Posttest	17.4	2.47				

df=29 p<0.05

Table 6 showed that the mean pretest scores of severity of restless legs syndrome in experimental group is 26 (SD $\pm$ 1.6) and posttest mean score is 17.4 (SD $\pm$ 2.47) and mean difference is 8.6. The posttest mean score (17.4) was lower than the pretest mean score of (26). The paired 't' value was 12.12 which was significant at P< 0.05 level, which showed that stretching exercises intervention was effective in reducing restless legs syndrome**.** Hence, $\mathbf{H_1}$the mean posttest level of severity of restless legs syndrome score is significantly lower than the mean pretest level of severity of restless legs syndrome score among patients with chronic renal failure in experimental group was accepted.

TABLE 7: Comparison of mean, standard deviation, mean difference and paired 't' value of pretest and posttest level of fatigue among patients with chronic renal failure in experimental group.

n=30

S. No	Variable	Mean	Standard deviation	Mean difference	Paired 't' test	Table value
1.	Pretest	26.4	7.32	8	8.7	2.045
2.	Posttest	18.4	1.97			

df=29 p<0.05

Table 7 showed that the mean pre test scores of fatigue in experimental group is 26.4 (SD±7.32) and posttest mean score is 18.4 (SD ± 1.97) and mean difference is 8. The posttest mean score (18.4) was lower than the pretest mean score of (26.4). The paired 't' value was 8.7, which was significant at P< 0.05 level, which showed that stretching exercises intervention was effective in reducing fatigue**.**Hence,**H_2**the mean posttest level of fatiguescore is significantly lower than the mean pretest level of fatigue in experimental group was accepted.

SECTION E : Find out the effectiveness of stretching exercise on restless legs syndrome among patients with chronic renal failure between experimental and control group.

TABLE 8 : Comparison of mean, standard deviation, mean deviation and independent 't' value of posttest level of severity of restless legs syndrome among patients with chronic renal failure between experimental and control group.

$n_1 = 30$, $n_2 = 30$

S. No	Group	Mean	Standard deviation	Mean difference	Independent 't' value	Table value
1.	Experimental group	17.4	2.47	9.6	23.8	2.002
2	Control group	27	4.35			

df=58 $p<0.05$

Table 8 showed that the mean posttest level of severity of restless legs syndrome scores in experimental group 17.4 (SD$\pm$2.47) was significantly lower than the mean posttest level of severity of restless legs syndrome scores in control group 27(SD$\pm$4.35) and mean difference is 9.6. The independent 't' value was 23.8 which was significant at $P < 0.05$ level. Hence, $\mathbf{H_3}$ the mean posttest level of restless legs syndrome score in experimental group is significantly lower than the mean pretest level of restless legs syndrome score in control group was accepted.

SECTION F : Find out the effectiveness of Stretching exercise on fatigue score among patients with chronic renal failure between experimental and control group

TABLE 9 : Comparison of mean, standard deviation, mean deviation and independent‘t’ value of posttest level of fatigue scores among patients with chronic renal failure between experimental and control group:

$n_1 = 30, n_2 = 30$

S. No	Group	Mean	Standard deviation	Mean difference	Independent ‘t’ value	Table value
1.	Experimental group	18.4	1.97	8.2	20.4	2.002
2	Control group	26.6	5.1			

df=58 $p<0.05$

Table 9 showed that the mean posttest of level of fatigue scores in experimental group 18.4 (SD $\pm$ 1.97) was significantly lower than the mean posttest level of fatigue scores in control group 26.6 (SD $\pm$ 5.1) and mean difference is 8.2. The independent ‘t’ value was 20.4 which was significant at $P < 0.05$ level. Hence, $\mathbf{H_4}$ the mean posttest level of fatigue scores in experimental group is significantly lower than the mean posttest level of fatigue scores in control group was accepted.

SECTION G: **Association between the posttest level of severity of restless legs syndrome scores among patients with chronic renal failure and their selected demographic variables in experimental group.**

TABLE 10 : Association between the mean posttest level of severity of restless legs syndrome among patients with chronic renal failure and their selected demographic variables in experimental group.

n=30

S. No	DEMOGRAPHIC VARIABLES	LEVEL OF SEVERITY OF RESTLESS LEGS SYNDROME				χ^2	TABLE VALUE	INFERENCE
		Moderate		Severe				
		F	%	F	%			
1.	**Age(in years)**							
1.1	40-45 Years	3	10	2	6.7			
1.2	46-52 years	9	30	1	3.3	3.464	7.82 df=3	NS
1.3	53-59 years	10	33.3	1	3.3			
1.4	60-65 years	4	13.4	-	-			
2.	**Sex**						3.84	
2.1	Male	11	36.7	1	3.3	0.432	df=1	NS
2.2	Female	15	50	3	10			
3.	**Marital Status**:							
3.1	Married	15	50	4	13.4			
3.2	Unmarried	7	23.3	-	-	2.646	7.82 df=3	NS
3.3	Widow	3	10	-	-			
3.4	Divorce	1	3.3	-	-			

S. No	DEMOGRAPHIC VARIABLES	LEVEL OF SEVERITY OF RESTLESS LEGS SYNDROME				χ^2	TABLE VALUE	INFERENCE
		Moderate		Severe				
		F	%	F	%			
4.	**Education**							
4.1	No formal education	7	23.3	1	3.3			
4.2	Primary education	4	13.5	2	6.7		8.36 df=4	S
4.3	High school education	7	23.3	-	-	11.43		
4.4	Higher secondary Education	7	23.3	1	3.3			
4.5	Graduates	1	3.3	-	-			
5.	**Occupation**							
5.1	Self employed	9	30	1	3.3			
5.2	Government employee	2	6.7	-	-	2.939	7.82 df=3	NS
5.3	Unemployed	5	16.7	2	6.7			
5.4	Private employee	10	33.3	1	3.3			
6.	**Family monthly**							
6.1	**Income**:	13	43.3	1	3.3			
6.2	Rs.10,000-15,000/-	7	23.3	3	10	6.685	7.82 df=3	NS
6.3	Rs.15,000-20,000/-	2	6.7	-	-			
6.4	Rs.20,000-25,000	4	13.4	-	-			
	Above 25,000/-							
7.	**Duration of illness**:							
7.1	0-6 months	1	3.3	-	-			
7.2	7months-3 years	13	43.3	-	-	6.976	7.82 df=3	NS
7.3	3-5 years	10	33.3	2	6.7			
7.4	Above 5 years	2	6.7	2	6.7			

S. No	DEMOGRAPHIC VARIABLES	LEVEL OF SEVERITY OF RESTLESS LEGS SYNDROME				χ^2	TABLE VALUE	INFERENCE
		Moderate		Severe				
		F	%	F	%			
8.	**Duration of haemodialysis**							
8.1	**treatment**	1	3.3	-	-			
8.2	0-6 months	2	6.7	-	-	6.1782	8.36	NS
8.3	7months-1 year	9	30	1	3.3		df=4	
8,4	1 yr-1 ½ years	12	40	1	3.3			
8.5	1 ½- 2 years	2	6.7	2	6.7			
	Above 2 years							

S- Significant **NS- Non significant** **P<0.05**

Table 10 Chi Square values were calculated to find out the association between posttest level of restless legs syndrome scores among patients with chronic renal failure and their demographic variables. The findings revealed that there was no significant association with demographic variables except for education (χ^2=11.43) in experimental group at P<0.05 level of significance. Hence, H_5 there was significant association between the posttest level of severity of restless legs syndrome scores among patients with chronic renal failure and their selected demographic variables in experimental group was not accepted except for education.

SECTION H : Association between the posttest level of fatigue scores among patients with chronic renal failure and their selected demographic variable in experimental group:

TABLE 11 : Association between the mean posttest level of fatigue among patients with chronic renal failure and their selected demographic variables in experimental group:

n=30

S. No	DEMOGRAPHIC VARIABLES	LEVEL OF FATIGUE				χ^2	TABLE VALUE	INFERENCE
		Mild		Moderate				
		F	%	F	%			
1.	**Age(in years)**							
1.1	40-45 Years	5	16.7	-	-			
1.2	46-52 years	9	30	1	3.3	1.816	7.82	NS
1.3	53-59 years	9	30	2	6.7		df=3	
1.4	60-65 years	4	13.3	-	-			
2.	**Sex**							
2.1	Male	11	36.6	1	3.3	0.06	3.84	
2.2	Female	16	53.4	2	6.7		df=1	NS
3.	**Marital status**:							
3.1	Married	17	56.7	2	6.7			
3.2	Unmarried	6	20	1	3.3	0.708	7.82 df=3	NS
3.3	Widow	3	10	-	-			
3.4	Divorce	1	3.3	-	-			

S. No	DEMOGRAPHIC VARIABLES	LEVEL OF FATIGUE				χ^2	TABLE VALUE	INFERENCE
		Mild		Moderate				
		F	%	F	%			
4.	**Education**							
4.1	No formal education	7	23.3	1	3.3			
4.2	Primary education	5	16.8	1	3.3			
4.3	High school education	7	23.3	-	-	9.281	8.36 df=4	S
4.4	Higher secondary education	7	23.3	1	3.3			
4.5	Graduates	1	3.3	-	-			
5.	**Occupation**							
5.1	Self employed	8	26.7	2	6.7			
5.2	Government employee	2	6.7	-	-	2.31	7.82 df=3	NS
5.3	Unemployed	7	23.3	-	-			
5.4	Private employee	10	33.3	1	3.3			
6.	**Family Monthly Income:**							
6.1	Rs.10,000-15,000/-	13	43.3	1	3.3			
6.2	Rs.15,000-20,000/-	8	26.7	2	6.7	2.409	5.99 df=2	NS
6.3	Rs.20,000-25,000	2	6.7	-	-			
6.4	Above 25,000/-	4	13.3	-	-			
7.	**Duration of Illness:**							
7.1	0-6 months	1	3.3	-	-			
7.2	7months-3 years	12	40	1	3.3	1.222	7.82 df=3	NS
7.3	3-5 years	11	36.8	1	3.3			
7.4	Above 5 years	3	10	1	3.3			

S. No	DEMOGRAPHIC VARIABLES	LEVEL OF FATIGUE				χ^2	TABLE VALUE	INFERENCE
		Mild		Moderate				
		F	%	F	%			
8.	**Duration of Haemodialysis Treatment**							
8.1	0-6 months	1	3.3	-	-	11.62	8.36 df=4	S
8.2	7 months-1 year	2	6.7	-	-			
8.3	1 yr-1 ½ yrs	9	30.1	1	3.3			
8.4	1 ½- 2 yrs	12	40	1	3.3			
8.5	Above 2 yrs	3	10	1	3.3			

S- Significant **NS- Nonsignificant** **P<0.05**

Table 11 Chi Square values were calculated to find out the association between posttest level of fatigue scores among patients with chronic renal failure and their demographic variables. The findings revealed that there was no significant association with demographic variables except for education (χ^2 = 9.281), duration of haemodialysis treatment (χ^2 = 11.62), in experimental group at P<0.05 level of significance. Hence, **H_6** that there was significant association between the posttest level of fatigue among patient with chronic renal failure and their selected demographic variables in experimental group was not accepted except for education and duration of haemodialysis treatment.

CHAPTER- V
DISCUSSION

The discussion chapter deals with sample characteristics and objectives of the study. The aim of this present study was to evaluate the effectiveness of stretching exercises on restless legs syndrome and fatigue among patients with chronic renal failure in selected hospitals at Erode.

DISTRIBUTION OF SAMPLE CHARACTERISTICS:

The demographic characteristics of patients with chronic renal failure are age, sex, marital status, educational status, occupational status, family monthly income, duration of the illness, and duration of the treatment.

Distribution of patients with chronic renal failure according to their age group depicts in experimental group the majority 11 (36.7%) belongs to the age group of 53-59 years, 10(33.3%) belongs to the age group of 46-52 years, 5(16.7%) belongs to the age group of 40-45 years, 4(13.3%) belongs to the age group of 60-65 years. In control group, majority of patients 15(50%) belongs to the age group of 53-59 years, 8(26.6%) belongs to the age group of 46-52 years, 5(16.7%) belongs to the age group of 40-45 years and 2(6.7%) belongs to the age group of 60-65years.

These findings are consistent with the findings of **Kithsiri Bandara Jayasekaraet.al (2015)** who reported that the median prevalence of chronic kidney disease. The prevalence of chronic kidney disease in different age groups was 3% in those aged 30–40 years; 7% in those aged 41–50 years, 20% in those aged 51–60 years, and 29% in those older than 60 years.

Regarding sex in experimental group majority of patients 18(60%) were females, 12(40%) were males. In control group majority of patients 19 (63.3%) were females, 11(36.7%) were males.

These findings are consistent with the findings of **CU Odenigbo et.al.,(2014)** who reported that the prevalence of CKD was significantly higher in the females subjects than their male counterparts. Subjects with CKD had 33.33% (38/74) males and 64.3% (36/74) females.

Regarding marital status in experimental group, majority of patients 19(63.3%) were married, 7(23.4%) was unmarried, 3(10%) was a widow, 1(3.3%) was divorced. In control group, majority of patients 24(80%) were married, 4(13.3%) were unmarried, 2(6.7%) were widow.

Regarding education in experimental group, majority of the patients 8(26.7%) had no formal education, 8(26.7%) had higher secondary education, 7(23.3%) had high school education, 6(20%) had primary education and 1(3.3%) was a graduate. In control group majority of patients 11(36.7%) had primary education, 8(26.6%) had higher secondary education, 5(16.7%) had no formal education, 3(10%) had high school education and 3(10%) were graduates.

These findings are consistent with the findings of **Y. J. Anupama and G. Uma et.al.,(2014)**Prevalence of chronic kidney disease (CKD) appears to be increasing in 36.39% did not have any education, whereas 29.17% and 23.81% had primary and higher secondary education respectively. Only 11% had received any form of college education.

Regarding occupational status in experimental group, majority 11(36.7%) were private employee, 10(33.3%) were self employed, 7(23.3%) were unemployed, 2(6.7%) was government employee. In control group, majority 19(63.3%) were unemployed, 5(16.7%) were self employed and 4(13.3%) were private employee, 2(6.7%) was government employee.

These findings are consistent with the findingsof **Margorit rita krespiet.al.,(2013)** who reported that employment of haemodialysis patients 18 (12%) were employed, 49 (32%) were unemployed, 69 (45%) were retired, and 17 (11%) were housewives/homemakers, unemployment affects up to 75% of incident ESRD patients .

Regarding family monthly income in experimental group, majority 14(46.6%) had an income between Rs.10,000-Rs.15,000, 10(33.3%) had an income between Rs.15,000-Rs.20,000, 4(13.4%) had an income of above 25,000, 2(6.7%) had an income between Rs.20,000-Rs.25,000,. In control group, majority 17(56.7%) had an income between Rs.15,000-20,000, 7(23.3%) had an income between Rs.10,000-15,000, 4(13.3%) had an income between Rs.20,000-25,000, 2(6.7%) had an income between of above 25,000.

These findings are consistent with the findings of **MN Haq et al.,(2013)** CKD is more prevalent with respondents having monthly income of BDT <5000 42.0% whereas 19.3% of the respondents had monthly income of BDT >20000. Regarding monthly family income, median were BDT 25000, among them 32.7% were in category of BDT 20001-30000 and 28.0% were in category of BDT 10001-20000.

Regarding duration of illness, in experimental group majority of the patients with chronic renal failure 13(43.3%) had duration of illness between 7 months-3 years, 12(40%) had duration of illness between 3 to 5 years and 4(13.4%) had duration of illness for above 5 years, 1(3.3%) had duration of illness between 0-6 months. In control group majority 16(53.3%) had duration of illness between 7 months to 3 years, 7(23.3%) had duration of illness for 3 to 5 years, 5(16.7%) had duration of illness for 0-6 months and 2(6.7%) had the illness for above 5 years.

These findings are consistent with the findings of **L Rahman.,(2013)** who reported that the prevalence of CKD regarding duration of disease, most of the respondents were in the category of 1 year or less (45.3%), indicating recently diagnosed CKD. The current study revealed that 10% of the respondents had history of previous kidney disease other than CKD.

Regarding duration of haemodialysis treatment, in experimental group majority 13(44.3%) had duration of treatment for 1 ½ years to 2 years, 10(33.3%) had duration of treatment for 1year to 1 ½ year and, 4(13.3%) had duration of treatment for above 2 years and 2(6.6%) had duration of treatment for 7months to 1 year, 1(3.3%) had duration of treatment for 0-6 months, 9(30%) had duration of treatment for above 2 years, 5(16.7%) had duration of treatment for 7months to 1 year, 5(16.6%) had the duration of treatment for1year to 1 ½ year, 1(3.3%) had the duration of treatment for 1 ½ years to 2 years.

FINDINGS OF THE STUDY ARE DISCUSSED ACCORDING TO THE OBJECTIVES AS FOLLOWS:

OBJECTIVES

1)To assess the pretest and posttest level of severity of restless legs syndrome and fatigue among patients with chronic renal failure in experimental and control group.

2) To compare the pretest and posttest level of severity of restless legs syndrome among patients with chronic renal failure in experimental group.

3)To compare the pretest and posttest level of fatigue among patients with chronic renal failure in experimental group.

4)To evaluate the effectiveness of stretching exercises on severity of restless legs syndrome among patients with chronic renal failure between experimental and control group.

5)To evaluate the effectiveness of stretching exercises on fatigue among patients with chronic renal failure between experimental and control group.

6)To find the association between the posttest level of restless legs syndrome among patients with chronic renal failure and their selected demographic variables in experimental group.

7)To find the association between the posttest level of fatigue among patients with chronic renal failure and their selected demographic variables in experimental group.

OBJECTIVE:1

To assess the pretest and posttest level of severity of restless legs syndrome and fatigue among patients with chronic renal failure in experimental and control group.

Among patients with chronic renal failure in pre test of experimental group, majority 23(76.6%) had severe level of restless legs syndrome and 5(16.7%) had very severe level of restless legs syndrome and 2(6.6%) had moderate level of restless legs syndrome. In control group 25(83.3%) had severe level of restless legs syndrome and 5(16.7%) had very severe level of restless legs syndrome; In posttest of severity of restless legs syndrome among experimental group, majority 26(86.7%) had moderate level of restless legs syndrome, 4(13.3%) had severe level of restless legs syndrome, where as in the control group 29(96.7%) of them had severe level of very severe level of restless legs syndrome and 1(3.3%) had very severe level of very severe level of restless legs syndrome.

Among patients with chronic renal failure in pre test of experimental group, majority 17(56.7%) were severely fatigued and 9(30%) were moderately fatigued and 4(13.3%) were extremely fatigued; whereas in control group

16(53.3%) were moderately fatigued and 14(46.7%) were severely fatigued; In the posttest level of fatigue among experimental group, majority 27(90%) were mildly fatigued, 3(10%) were moderately fatigued, where as in the control group 27(90%) of them were severely fatigued and 2 (6.7%) of them were extremely fatigued, 1(3.3%) were moderately fatigued.

The study was consistent with the study findings of **Sayyed Hossein Hashemi et al. (2014)** who reported that In pre-test, in experimental group out of 15 samples 5 (33%) of them had mild, 9 (60%) of them had moderate and 1 (7%) had severe level of Restless leg syndrome. In control group out of 15 samples 5 (33%) of them had mild, 9 (60%) of them had moderate and 1 (7%) had severe level of Restless leg syndrome. In post-test, out of 15 samples 10 (67%) of them had mild, 5 (33%) of them had moderate and none of them had severe level of restless leg syndrome in control group. In control group out of 15 samples 5 (33%) of them had mild, 9 (60%) of them had moderate and 1 (7%) had severe level of Restless leg syndrome.

OBJECTIVE:2

To compare the pretest and posttest level of severity of restless legs syndrome among patients with chronic renal failure in experimental group.

The data analysis showed that mean pretest and posttest scores of severity of restless legs syndrome among patients with chronic renal failure in experimental group were 26 (SD $\pm$1.6) and 17.4 (SD $\pm$2.47) respectively. The posttest mean score (17.4) was lower than the pre test mean score (26). The paired 't' value was 12.12 which was significant at $P< 0.05$ level, which showed that the stretching exercises was effective in reducing the severity of restless legs syndrome among patients with chronic renal failure.

The study was consistent with the study findings of **Kaur J et al.,(2016)** who reported that in baseline the restless legs syndrome mean score was 0.59 and

after a week of stretching exercise program implementation the mean score was reduced to 0.34. Intervention was found to be effective in reduction of restless legs syndrome symptoms of haemodialysis patients significantly ($p \leq 0.05$), whereas there was no significant change found in the control group.

OBJECTIVE:3

To compare the pretest and posttest level of fatigue among patients with chronic renal failure in experimental group.

Data analysis showed that the mean pre test scores of level of fatigue in experimental group is 26.4 (SD$\pm$7.32) and posttest mean score is 18.4 (SD $\pm$ 1.97) respectively. The posttest mean score (18.4) was lower than the pre test mean score is (26.4) The paired 't' value was 8.7 which was significant at $P< 0.05$ level.

The study was consistent with the study findings of **Radha Maniam., (2014)** who reported that the paired sample *t*-test indicated improvements in fatigue level in the exercise group (mean fatigue score: post-treatment (40.5 ± 7.9) vs. pre-treatment (30.0 ± 10.9).

OBJECTIVE:4

To evaluate the effectiveness of stretching exercises on severity of restless legs syndrome among patients with chronic renal failure between experimental and control group.

Data analysis showed that the mean posttest of severity of restless Legs syndrome scores among patients with chronic renal failure in experimental group and control group were 17.4(SD $\pm$ 2.47) and 27 (SD $\pm$ 4.35) respectively and the mean difference was 9.6. The Independent 't' value was 23.8 which was significant at $P < 0.05$ level.

This study consistent with the findings of **Mansooreh Aliasgharpour et.al.,(2016)** who reported that results of t-test showed that the changes in the severity of restless legs syndrome symptoms before intervention and after 4 weeks were not statistically meaningful between intervention and control groups. In this study, the severity scores in the intervention group were 18.94 in the beginning and it decreased to 12.41 at the end of the 8^{th} week. The changes are totally significant, but not in the control group.

OBJECTIVE:5

To evaluate the effectiveness of stretching exercises on fatigue among patients with chronic renal failure between experimental and control group.

Data analysis showed that the mean posttest scores of level of fatigue among patients with chronic renal failure in experimental and control group were 18.4 (SD $\pm$ 1.97) and 26.6 (SD $\pm$ 5.1) respectively. The mean difference was 8.2. The Independent 't' value was 20.4 which was significant at $P < 0.05$ level.

The study findings are consistent with the findings of **Veeram Reddy Thejaswi**.,**et.al.,(2016)** who reported that in experimental group the posttest mean is 27.5 with standard deviation of 9.74 where as in control group the mean is 35.4 with standard deviation of 15.3. The calculated value is 2.20 is greater than the tabulated value1.69 at $P< 0.005$ and the leg stretching exercises are effective in reducing the fatigue levels of patients undergoing haemodialysis with chronic renal failure.

OBJECTIVE: 6

To find the association between the posttest level of restless legs syndrome among patients with chronic renal failure and their selected demographic variables in experimental group:

Chi Square values were calculated to find out the association between posttest level of severity of restless legs syndrome scores among patients with chronic renal failure and their demographic variables. The findings revealed that there was no significant association with demographic variables except for education (χ^2 =11.43) in experimental group.

OBJECTIVE:7

To find the association between the posttest level of fatigue among patients with chronic renal failure and their selected demographic variables in experimental group.

Chi Square values were calculated to find out the association between posttest level of fatigue scores among patients with chronic renal failure and their selected demographic variables. The findings revealed that there was no significant association with demographic variables except for education (χ^2 = 9.281), duration of haemodialysis treatment (χ^2 = 11.62), in experimental group.

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATIONS, RECOMMENDATIONS AND LIMITATIONS

This chapter is discussed under five headings

1. Summary
2. Conclusion
3. Implications
4. Recommendations
5. Limitation

SUMMARY OF THE STUDY

The aim of the present study was to evaluate the effectiveness of stretching exercises on Restless legs syndrome and fatigue among patients with chronic renal failure in selected hospitals at Erode. The design used for the present study was Quasi experimental non equivalent control group pre test and posttest design. The conceptual frame work was based on **Modified Wiedenbach's helping art of clinical nursing theory (1964**). Sample size was 60, out of which 30 were in experimental group and 30 were in control group. Non-probability purposive sampling method was used to select the samples. The tool used for this study was Walter's international restless legs syndrome study group scale to assess the level of severity of restless legs syndrome and Helen.J. Michielsen's fatigue assessment scale to assess the fatigue level before and after intervention. The data collection period was 6 weeks.

Patients were divided in to 3 groups. On the first day 10 samples were selected for experimental group and 10 for control group. On the first day, screening was done by using Walter's International Restless legs syndrome Study Group criteria for the diagnosis of restless legs syndrome. The samples who scored 5 in the screening test were selected. Data pertaining to the demographic variables were collected by interview and then pretest was conducted by using Walter's international restless legs syndrome study group scale and fatigue assessment scale by structured interview schedule in both the groups. From the first day onwards stretching exercises which includes hip rotation to the sides, quadriceps stretch, knee-to-chest, hamstring stretch, straight leg raise, gluteal stretch, side lying leg lift was taught to the participants individually by using laptop and next day onwards made the participants to do the exercises with the help of seeing flash cards in the experimental group individually for 30 minutes which was carried out one hour before and one hour after haemodialysis continued for a period of 15 days. On the 15th day posttest was conducted for the experimental group and control group by using the same scales. Same procedure was continued for the other 2 groupsin experimental group and control group.

The collected data were analyzed and tabulated using descriptive and inferential statistics.

MAJOR FINDINGS OF THE STUDY

Themajor findings are,

- In experimental group, majority of patients with chronic renal failure are 11(36.7%) belongs to the age group of 53-59 years, 10(33.3%) belongs to the age group of 46-52 years, 5(16.7%) belongs to the age group of 40-45 years, 4(13.3%) belongs to the age group of 60-65 years. In control group, majority of patients 15(50%) belongs to the age group of 53-59 years, 8(26.6%) belongs to the age group of 46-52 years, 5(16.7%) belongs to the

age group of 40-45 years and 2(6.7%) belongs to the age group of 60-65years.

- In experimental group, majority of patients 18(60%) were females, 12(40%) were males. In control group majority of patients 19 (63.3%) were females, 11(36.7%) were males.

- In experimental group, majority of patients 19(63.3%) were married, 7(23.4%) was unmarried, 3(10%) was a widow, 1(3.3%) was divorce. In control group, majority of patients 24(80%) were married, 4(13.3%) were unmarried, 2(6.7%) were widow.

- In experimental group, majority of the patients 8(26.7%) had no formal education, 8(26.7%) had higher secondary education, 7(23.3%) had high school education, 6(20%) had primary education and 1(3.3%) was a graduate. In control group majority of patients 11(36.7%) had primary education, 8(26.6%) had higher secondary education, 5(16.7%) had no formal education, 3(10%) had high school education and 3(10%) were graduates.

- In experimental group, majority 11(36.7%) were private employee, 10(33.3%) were self employed, 7(23.3%) were unemployed, 2(6.7%) was government employee. In control group, majority 19(63.3%) were unemployed, 5(16.7%) were self employed and 4(13.3%) were private employee, 2(6.7%) was government employee.

- In experimental group, regarding family monthly income majority 14(46.6%) had an income between Rs.10,000-Rs.15,000, 10(33.3%) had an income between Rs.15,000-Rs.20,000 , 4(13.4%) had an income of above 25,000, 2(6.7%) had an income between Rs.20,000-Rs.25,000,. In control group, majority 17(56.7%) had an income between Rs.15,000-20,000,

7(23.3%) had an income between Rs.10,000-15,000, 4(13.3%) had an income between Rs.20,000-25,000, 2(6.7%) had an income of above 25,000.

- In experimental group, majority of the patients with chronic renal failure 13(43.3%) had duration of illness between 7 months-3 years, 12(40%) had duration of illness between3 to 5 years and 4(13.4%) had duration of illness for above 5 years, 1(3.3%) had duration of illness between 0 to 6 months. In control group majority 16(53.3%) had duration of illness between 7 months to 3 years, 7(23.3%) had duration of illness for 3 to 5 years, 5(16.7%) had duration of illness for 0 to 6 months and 2(6.7%) had the illness for above 5 years.

- In experimental group, majority 13(43.3%) had duration of treatment for 1 ½ years-2 years, 10(33.3%) had duration of treatment for 1year-1 ½ years and, 4(13.3%) had duration of treatment for above 2 years and 2(6.6%) had duration of treatment for 7months-1 year, 1(3.3%) had duration of treatment for 0-months, 9(30%) had duration of treatment for above 2 years, 5(16.7%) had duration of treatment for 7months-1 year, 5(16.6%) had the duration of treatment for1year-1 ½ years, 1(3.3%) had the duration of treatment for 1 ½ years-2 years.

- With regard to level of severity of restless legs syndrome, the paired ‘t’ value for experimental group was 12.12(table value=2.045) at $P< 0.05$ level of significance and posttest mean score (17.4) was lower than the pre test mean score is (26) , which showed that there is a significant reduction in level of severity of restless legs syndrome in experimental group.

- In relation with fatigue, the paired ‘t’ value for experimental group was 8.7 (table value=2.045) at $P< 0.05$ level of significance and the posttest mean score (18.4) was lower than the pre test mean score (26.4), which showed

that there is a significant reduction in level of fatigue in experimental group.

- The mean posttest of level of severity of restless legs syndrome in experimental group 17.4(SD±2.47) was significantly lower than the mean posttest level of severity of restless legs syndrome, in control group 27(SD±4.35). The Independent‘t’ value was 23.8(table value=2.002) which was significant at $P < 0.05$ level. This showed that, there is a significant reduction in the level of severity of restless legs syndrome between experimental group and control group and stretching exercise was found to be effective.

- The mean posttest of level of fatigue scores in experimental group 18.4(SD±1.97) was significantly lower than the mean posttest level of fatigue scores in control group 26.6(SD±5.1). The Independent ‘t’ value was 20.4 (table value=2.002) which was significant at $P < 0.05$ level. This showed that there is a significant reduction in the level of fatigue between experimental group and control group and the stretching exercise was found to be effective.

- The association between posttest level of severity of restless legs syndrome scores among patients with chronic renal failure and their demographic variables using Chi Square value, revealed that there was no significant association with demographic variables except for education (χ^2 =11.43) at $P< 0.05$ level of significance in experimental group.

- The association between posttest level of fatigue scores among patients with chronic renal failure and their demographic variables using Chi Square value, revealed that there was no significant association with demographic variables except for education (χ^2 = 9.281), duration of

haemodialysis treatment (χ^2 = 11.62) at P< 0.05 level of significance in experimental group.

The study revealed that stretching exercises was effective in reducing level of severity of restless legs syndrome and fatigue among patients with chronic renal failure.

CONCLUSION:

The present study was conducted to evaluate the effectiveness of stretching exercise on severity of restless legs syndrome and fatigue among patients with chronic renal failure in Nallaswamy kidney center and Maaruthi medical centre at Erode. The mean posttest of level of severity of restless legs syndrome scores in experimental group 17.4 (SD±2.47) was significantly lower than the mean posttest level of severity of restless legs syndrome scores in control group 27 (SD±4.35). The Independent 't' value was 23.8(table value=2.002) which was significant at P < 0.05 level. This showed that there is a significant reduction in the level of severity of restless legs syndrome between experimental group and control group. The mean posttest of level of fatigue scores in experimental group 18.4 (SD±1.97) was significantly lower than the mean posttest level of fatigue scores in control group 26.6 (SD±5.1). The Independent 't' value was 20.4(table value=2.002) which was significant at P < 0.05 level. This showed that there is a significant reduction in the level of fatigue between experimental and control group.

The results of the study concluded that stretching exercises was effective in reducing the severity of restless legs syndrome and fatigue among patients with chronic renal failure.

IMPLICATIONS

The findings of the study have certain important implication for nursing service, nursing education, nursing administration, and nursing research.

Nursing service

- ♣ Nurses could be motivated to practice stretching exercises to reduce the level of severity of restless legs syndrome and fatigue among patients with chronic renal failure.

- ♣ Nurse as the change agent, can organize continued nursing education programme to the staffs regarding various measures for the reduction of severity of restless legs syndrome and fatigue among patients with chronic renal failure.

Nursing education:

- ♣ The nurse educator can orient the students with alternative therapies in reducing the level of severity of restless legs syndrome and fatigue among patients with chronic renal failure.

- ♣ Nurse educators can conduct workshops/ seminars to update the knowledge of students and to promote practicing stretching exercise and relaxation techniques among patients with chronic renal failure.

Nursing administration:

- ♣ Nurse administrator can organize continuing education programmes for staffs on alternative therapies which could be used among patients with chronic renal failure in reducing severity of restless legs syndrome and fatigue.

- ♣ Nurse administrator could distribute information booklet about stretching exercises to patients with chronic renal failure in the haemodialysis unit.

- ♣ Nurse administrator could paste posters related to stretching exercises in dialysis unit/ haemodialysis preparation unit**.**

Nursing research:

- ♣ The study findings can be a baseline for further studies to build upon for improving the body of knowledge in nursing.
- ♣ The study findings can be effectively utilized by the emerging researchers to conduct further studies.
- ♣ Nurse researcher can motivate the students to do mini projects on alternative therapies to relieve severity of restless legs syndrome and fatigue among patients with chronic renal failure.

RECOMMENDATIONS

Based on the findings the following recommendations were stated,

- Similar study could be replicated in a larger samples thereby findings could be generalized to a large population.
- Comparative study could also be done between the effectiveness of various alternative therapies measures on reducing severity of restless legs syndrome and fatigue among patients with chronic renal failure.
- Similar study could be conducted in patients with other chronic illnesses such as diabetes and peripheral neuropathy.

LIMITATION:

- ➢ Since the understanding level of the patients was different, patients took more than 15 minutes to accept the intervention.

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APPENDIX –A

BISHOP'S COLLEGE OF NURSING
(C.S.I. Trichy - Tanjore Diocese)
C.S.I.Mission Compound, DHARAPURAM - 638 656.
Tiruppur District.
✆ Off : 04258 : 221224, 223962
Fax : 04258 - 221224
e.mail : principalbcndpm@gmail.com

Ref :

Date :.....

23.11.2017

LETTER SEEKING PERMISSION FOR CONDUCTING THE STUDY

To:
The Director ,
Dr. K. M. Nallaswamy kidney center
Erode
Tamilnadu-638001.

Respected Sir;

This is to certify that Mrs. A.priscilla is a bonafide student of our college doing her M.Sc., (N) programme II year. As part of her requirement under, the Tamil Nadu Dr.MGR Medical University, Chennai. She has to do a project on "**A study to evaluate the effectiveness of stretching exercises on Restless Legs Syndrome and fatigue among patients with chronic renal failure in Your hospital**".

Kindly permit her to carry out the study in your hospital.

Thanking You,

Permission granted

27/11/17

Dr N. YOHEESWARAN, M.B.B.S., DNB.,
Reg. No 91862
Consultant Urologist
DR. K.M. NALLASWAMY HOSPITAL
98, POWER HOUSE ROAD,
ERODE - 638 001.

Yours Faithfully

PRINCIPAL
BISHOP'S COLLEGE OF NURSING,
C.S.I.MISSION COMPOUND,
DHARAPURAM-638 656,
TIRUPUR DISTRICT

Maaruthi Medical Centre and Hospitals

300 Bed Multi Speciality Hospital

Dr. M. N. SADASIVAM M.S., D.L.O,
Chairman

565, Perundurai Road, Erode - 638 011, Tamil Nadu, India.
Tel : + 91 424 2250517, 2264949, 2266768, 2264040
Telefax : + 91 424 2257091, Cell : 093627 33330, 44440

To

The Principal,
Bishop's College of Nursing,
C.S.I.Mission compound,
Dharapuram.

Respected Mam,

Sub: Permitting the student for conduct her study – Reg.

We are very much willing to permit your M.Sc(Nursing) student A.Priscilla to conduct her study in our institution.

Thank you,

05.11.2017

Your's truly,

5/11/17

Dr.M.N.Sadasivam

Maaruthi Medical Centre & Hospitals Erode-11

Health Care - Beyond the Best

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BISHOP'S COLLEGE OF NURSING

(C.S.I. Trichy - Tanjore Diocese)
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Tiruppur District.

☎ Off: **04258** - **221224**
223962
Fax : **04258 221224**
E - Mail : Principalbcndpm@gmail.com

Ref :

Date.....

To:

The Dean
Kalyani Kidney Care Centre
Erode.
Tamilnadu-638009

Respected Sir;

This is to certify that Mrs. A.priscilla is a bonafide student of our college doing her M.Sc., (N) programme II year. As part of her requirement under, the Tamil Nadu Dr.MGR Medical University, Chennai she has to do a project on " **A study to evaluate the effectiveness of stretching exercises on Restless Legs Syndrome and fatigue among patients with chronic renal failure in Your hospital at Erode**".

Kindly permit her to carry out the study in your hospital.

Thanking You,

Yours Faithfully,

PRINCIPAL,
BISHOP'S COLLEGE OF NURSING
C.S.I.MISSION COMPOUND,
DHARAPURAM-638 656,
TIRUPUR DISTRICT

Dr. M. PRABHAKAR, M.S.,DNB (Urology)
Consultant Urologist
Reg. No A06 202
Date & Time.....

APPENDIX – B

LETTER SEEKING EXPERTS OPINION FOR CONTENT VALIDITY

From

Mrs. A.Priscilla,
M.sc (Nursing) II Year,
Bishop's college of nursing,
Dharapuram.

To

Respected Madam / sir,

Sub: Requisition for content validity of tool.

I am doing M.Sc (Nursing) II year in Bishop's college of nursing, Dharapuram under The Tamil Nadu Dr. M.G.R. Medical university, Guindy, Chennai. As a partial fulfillment of my M.sc (Nursing) Degree Programme, I am conducting a research on, "**A study to evaluate the effectiveness of stretching exercises on restless legs syndrome and fatigue among patients with chronic renal failure in selected hospitals at Erode".**A tool has been developed for the research study. I am sending the above stated for your expert and valuable opinion. I will be thankful for your kind consideration. Kindly return it to the undersigned.

Thanking you,

Yours faithfully,

(A.Priscilla)

Enclosure :

1. Certificate of content validity.
2. Statement of problem, objectives, operation definition, hypothesis.
3. Description of the tool and tool for data collection.
4. Self addressed envelope.

APPENDIX – C

MEDICAL SURGICAL NURSING LIST OF EXPERTS FOR VALIDATION

1 .**Dr. N. Yogeeshwaran, M.B.B.S, DNB,**

Consultant Urologist,

Nallaswamy kidney center,

Erode.

2. **Prof.E.ShobaMerina, M.Sc(N)**

Principal,

Sara college of nursing,

Dharapuram.

3. **Prof.Sasikala, M.Sc(N),**

Professor,

College of Nursing, Sri Ramakrishna Institute of paramedical Sciences,

Coimbatore.

4. **Prof. Kanchana, M.Sc(N),**

Professor,

College of Nursing, Sri Ramakrishna Institute of Paramedical Sciences,

Coimbatore-44

5. **Prof.Mangayarkarasi, M.Sc(N),**

Principal,

Maharani college of Nursing,

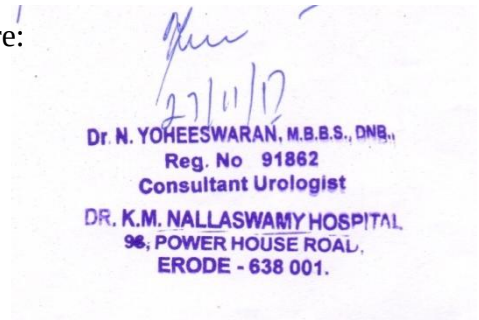
Dharapuram.

APPENDIX – D

CERTIFICATE FOR VALIDITY

This is to certify that the standardized tool on **"A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AND FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE IN SELECTED HOSPITALS AT ERODE.",** has been validated by me and found appropriate with mentioned suggestions.

Signature:



Name:

Designation:

CERTIFICARE FOR VALIDITY

This is to certify that the standardized tool on **"A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AND FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE IS SELECTED HOSPITALS AT ERODE"** has been validated by me and found appropriate with mentioned suggestions.

Signature: J. Shobha

PRINCIPAL
Sara Nursing College,
Dharapuram - 638 673.

Name: M&S. Sheba. E. Merina

Designation: Principal

CERTIFICARE FOR VALIDITY

This is to certify that the standardized tool on **"A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AND FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE IS SELECTED HOSPITALS AT ERODE"** has been validated by me and found appropriate with mentioned suggestions.

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CERTIFICARE FOR VALIDITY

This is to certify that the standardized tool on **"A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AND FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE IS SELECTED HOSPITALS AT ERODE"** has been validated by me and found appropriate with mentioned suggestions.

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CERTIFICARE FOR VALIDITY

This is to certify that the standardized tool on **"A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AND FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE IS SELECTED HOSPITALS AT ERODE"** has been validated by me and found appropriate with mentioned suggestions.

Signature: 

Name: Mrs. A. RANGAIYARKARASI, MSc(N)

Designation: PRINCIPAL

PRINCIPAL
MAHARANI NURSING COLLEGE
DHARAPURAM-638 657

APPENDIX- E

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation work on "**A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AND FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE IN SELECTED HOSPITALS AT ERODE"** done by Mrs.A. Priscilla II year M.Sc., (Nursing) student of Bishop's College of Nursing, Dharapuram is edited for English language appropriateness by _____

Date:

Signature

Address:

S. INBANATHAN M.A.,M.Ed.,M.Phil.,
PG. Assistant in English
C.S.I. Girls Hr.Sec. School,
Dharapuram- 638 656.

APPENDIX- F

CERTIFICATE OF TAMIL EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation work on "**A STUDY TO EVALUATE THE EFFECTIVENESS OF STRETCHING EXERCISES ON RESTLESS LEGS SYNDROME AND FATIGUE AMONG PATIENTS WITH CHRONIC RENAL FAILURE IN SELECTED HOSPITALS AT ERODE"** done by Mrs.A. Priscilla II year M.Sc., (Nursing) student of Bishop's College of Nursing, Dharapuram is edited for Tamil language appropriateness by _____

Signature

Date:

Address:

APPENDIX- G

TOOL - ENGLISH

SECTION-A

DEMOGRAPHIC VARIABLES

1. Age
   a) 40-45 years
   b) 42-52 years
   c) 53-59 years
   d) 60-65 years

2. Sex
   a) Male
   b) Female

3. Marital status
   a) Married
   b) Unmarried
   c) Widow
   d) Divorce

4. Education
   a) No formal education
   b) Primary education
   c) High school education
   d) Higher secondary education
   e) Graduates

5. Occupation
    a) Self employed
    b) Government employee
    c) Unemployed
    d) Private employee

6. Family monthly income
    a) Rs.10,001-15,000/-
    b) 15,001-20,000/-
    c) 20.001 -25,000/-
    d) Above 25,000/-

7. Duration of illness
    a) 0 -6 months
    b) 7 months -3 years
    c) 3 years – 5 years
    d) Above 5 years

8. Duration of getting haemodialysis treatment
    a) 0 – 6 months
    b) 7 months – 1 years
    c) 1 years – 1 ½ years
    d) 1 ½ -2 years
    e) Above 2 years.

Section-B

PART - I

SCREENING TOOL FOR RESTLESS LEGS SYNDROME

S.NO	Essential Criteria	YES	NO
1.	An urge to move the legs, accompanied with or caused by unpleasant sensations in the legs?		
2.	An urge to move the legs or unpleasant sensations begin (or) worsen during (e.g. sitting, lying down or resting?)periods of rest or inactivity.		
3.	An urge to move the legs (e.g. walking or is partially or totally[relieved with movement?		
4.	An urge to move the legs, do you have unpleasant sensations in the legs like tingling, burning, cramps, pain?		
5.	An urge to move or unpleasant sensations are worse at night time as compared to day or only occur at night.		

International Restless legs syndrome Study Group criteria for the diagnosis of restless legs syndrome was used to screen the patients for restless legs syndrome.

It consists of 5 Yes/No Questions. It is rated as Normal, and diagnosed/Confirmed restless legs syndrome. The total score is 5.

PART - II

INTERNATIONAL RESTLESS LEG SYNDROME STUDY GROUP RATING SCALE FOR SEVERITY OF RESTLESS LEGS SYNDROME

Please rate the average symptoms during the preceding week.

1) Overall, how would you rate the restless legs syndrome discomfort in the legs or arms?

☐ Very Severe (4)

☐ Severe (3)

☐ Moderate (2)

☐ Mild (1)

☐ None (0)

2) Overall how would you rate the need to move around because of the restless legs syndrome symptoms?

☐ Very Severe (4)

☐ Severe (3)

☐ Moderate (2)

☐ Mild (1)

☐ None (0)

2) Overall, how much relief to the restless legs syndrome arm or leg discomfort did you get from moving around?

☐ Very Severe (4)

☐ Severe (3)

☐ Moderate (2)

☐ Mild (1)

☐ None (0)

4) Overall, how severe was the sleep disturbance because of the restless legs syndrome symptoms?

- ☐ Very Severe (4)
- ☐ Severe (3)
- ☐ Moderate (2)
- ☐ Mild (1)
- ☐ None (0)

5) How severe was the tiredness during the day due to the restless legs syndrome symptoms?

- ☐ Very Severe (4)
- ☐ Severe (3)
- ☐ Moderate (2)
- ☐ Mild (1)
- ☐ None (0)

6) Overall, how severe was the restless legs syndrome as a whole?

- ☐ Very Severe (4)
- ☐ Severe (3)
- ☐ Moderate (2)
- ☐ Mild (1)
- ☐ None (0)

7) How often did you get the restless legs syndrome symptoms?

- ☐ Very often; six to seven days (4)
- ☐ Often; four to five days (3)
- ☐ Sometimes; two to three days (2)
- ☐ Occasionally; one day or less (1)
- ☐ Never (0)

8) When you had restless legs syndrome symptoms, how severe were they an average day?

- ☐ Very Severe; at least eight hours per 24 hours (4)
- ☐ Severe; three to eight hours per 24 hours (3)
- ☐ Moderate one to three hours per 24 hours (2)
- ☐ Mild; less than one hour per 24 hours (1)
- ☐ None (0)

9) Overall, how severe was the impact of the restless legs syndrome symptoms on the ability to carry out the daily affairs (for example carrying out a satisfactory family, home, social, school or work)?

- ☐ Very Severe (4)
- ☐ Severe (3)
- ☐ Moderate (2)
- ☐ Mild (1)
- ☐ None (0)

10) How severe was the mood disturbance because of the restless legs syndrome symptoms (for example angry, depressed, sad, anxious, or irritable?

- ☐ Very Severe (4)
- ☐ Severe (3)
- ☐ Moderate (2)
- ☐ Mild (1)
- ☐ None (0)

Walter's International Restless legs syndrome study group rating scale was used to assess the level of restless legs syndrome. It consists of 10 questions, each with 5 options and scored as 4,3,2,1,0. The total score is 40.

SCORING CRITERIA ARE:

- Mild (score 0-10)
- Moderate (score 11-20)
- Severe (score 21-30)
- Very Severe (score 31-40)

FATIQUE ASSESSMENT SCALE:

(Helen J Michielsen -2002)

S. No	Questions	Never	Sometimes	Regularly	Often	Always
1	I am bothered by fatigue	1	2	3	4	5
2	I get tired very quickly	1	2	3	4	5
3	I don’t do much during the day	1	2	3	4	5
4	I have enough energy for everyday life	5	4	3	2	1
5	Physically, I feel exhausted	1	2	3	4	5
6	I have problems to start things	1	2	3	4	5
7	I have problems to think clearly	1	2	3	4	5
8	I feel no desire to do anything	1	2	3	4	5
9	Mentally, I feel exhausted	1	2	3	4	5
10	When I am doing something, I can concentrate quite well	5	4	3	2	1

Scorings are interpreted as follows:

It consists of 10 statements. It is rated as never, sometimes, regularly, often, always and scored as 1,2,3,4,5. The total score is 50 and it has reverse scores for the questions 4 and 10.

LEVEL OF FATIGUE	SCORE	PERCENTAGE (%)
Normal (Never)	1 -10	0 – 20
Mild fatigue (Sometimes)	11-20	21 -40
Moderate fatigue (Regularly)	21-30	41 – 60
Severe fatigue (Often)	31-40	61 -80
Extreme fatigue (Always)	41 -50	81 -100

TOOL – TAMIL

gphpT - m

rKjha FLk;g fhuzpfs;

1) taJ

m) 40-45tUlq;fs;

M) 46-52tUlq;fs;

,) 53-59tUlq;fs;

<) 60-65tUlq;fs;

2) ghypdk;

m) Mz;

M) ngz;

3) jpUkz epiy

m) jpUkzkhdth;

M) jpUkzkhfhjth;

,) tpjit

<) tpthfhuj;J ngw;wth;

4) fy;tpj; jFjp

m) gbf;fhjth;

M) Muk;gf;fy;tp

,) cah; epiyf; fy;tp

<) Nky; epiyf; fy;tp

c) gl;lg;gbg;G

5) njhopy;

m) Raj; njhopy;

M) muRg; gzp

,) Ntiy ,y;yhjthh;

<) jdpahh; Ntiy

6) FLk;g khj tUkhdk;

m) &10>000-& 15>000/-

M) & 15>000-& 20>000/-

,) & 20>000-& 25>000/-

<) & 25>000 w;F Nky

7) cly;epiy rhpapy;yhj fhyk;

m) 0-6 khjq;fs;

M) 7 khjq;fs; -3 tUlq;fs; tiu

,) 3-5 tUlq;fs;

<) 5 tUlq;fSf;F Nky;

8) ,uj;j Rj;jpfhpg;G rpfpr;ir ngw;WtUk;; fhyk;

m) 0 - 6 khjq;fs;

M) 7 khjq;fs;-1 tUlk; tiu

,) 1 tUlk; - 1 ½ tUlq;fs; tiu

<) 1 ½ -2 tUlq;fs;

c) 2 tUlj;jpw;FNky;.

gphpT - M

mikjpaw;wfhy;fs; Neha;f;Fwpfz;lwpAk; fUtp

t.vz;	mj;jpahtrpambg;gilfs;	Mk;	,y;iy
1.	fhy;fs; efh;j;Jtjw;fhd xU J}z;Ljy;> my;yJ fhy;fspy; tpUk;gj;jfhj czh;TfSld; Nrh;e;J Vw;gLfpwjh?		
2.	fhy;fs; efh;j;Jtjw;fhd xU J}z;Ljy;> tpUk;gj;jfhj czh;TfSld; Muk;gpf;fpwjh my;yJ cl;fhh;e;J> gLj;jpUe;J Xa;T vLf;Fk; Neuq;fspy; my;yJ ve;jNtiyAk; nra;ahj Neuq;fspy; Vw;gLfpwjh?		
3.	fhy;fs; efh;j;Jtjw;fhd xU J}z;Ljy; vg;nghOJ tpLgLfpwJ? (cjhuzkhf elf;Fk;NghJ my;yJ ghjp my;yJ KOikahf)		
4.	fhy;fs; efh;j;Jtjw;fhd xU J}z;Ljy;> cq;fSf;F fhy;fspy; ,Uf;Fk; tpUk;gj;jfhj czh;Tfshf> fhy; vhpr;ry;> $r;r czh;T> gpbg;Gfs;> typfspdhy; efh;j;JfpwPh;fsh?		
5.	fhy;fs; efh;j;Jtjw;fhd J}z;Ljy;> my;yJ tpUk;gj;jfhj czh;TfSld; NkhrkiltJ ,uT Neuq;fis tpl gfy; Neuq;fspy; my;yJ ,uT Neuj;jpy; kl;Lkh?		

சர்வதேசஅமைதியற்றகால்கள்நோய்க்குறிஆய்வுகுழுமதிப்பீட்டுஅளவு

1. ஒட்டுமொத்தமாக, எப்படி உங்கள் கால்கள் அல்லது கைகளில் அமைதியற்ற கால்கள் நோய்க்குறி அசௌகரியம் மதிப்பிட வேண்டும்

   ☐ மிகவும்கடுமையானது(4)
   ☐ கடுமையான(3)
   ☐ மிதமான(2)
   ☐ லேசான(1)
   ☐ எதுவும்இல்லை(0)

2. உங்கள் அமைதியற்ற கால்கள் நோய்க்குறி காரணமாக நீங்கள் சுற்றி நகர்த்த வேண்டிய அவசியத்தை ஒட்டு மொத்தமாக எப்படி மதிப்பிடுவீர்கள்

   ☐ மிகவும்கடுமையானது(4)
   ☐ கடுமையான(3)
   ☐ மிதமான(2)
   ☐ லேசான(1)
   ☐ எதுவும்இல்லை(0)

3. ஒட்டு மொத்தமாக, உங்கள் அமைதியற்ற கால்கள் நோய்க்குறி கை அல்லது கால் அசௌகரியம் எவ்வளவு நிவாரணம் நீங்கள் சுற்றி நகரும்போது கிடைத்தது.

   ☐ நிவாரணம்இல்லை(4)
   ☐ மிதமானநிவாரணம்(3)
   ☐ லேசான நிவாரணம்(2)
   ☐ கிட்டத்தட்ட முழு நிவாரணம் அல்லது முழு நிவாரணம்(1)
   ☐ அறிகுறிகள் இல்லை(0)

4. மொத்தத்தில், உங்கள் அமைதியற்ற கால்கள் நோய்க்குறி அறிகுறிகளின் காரணமாக உங்கள் தூக்கமின்மை எவ்வளவு கடுமையாக இருந்தது

   ☐ மிகவும்கடுமையானது(4)
   ☐ கடுமையான(3)
   ☐ மிதமான(2).
   ☐ லேசான(1)
   ☐ எதுவும்இல்லை(0)

5. உங்கள் அமைதியற்ற கால்கள் நோய்க்குறி காரணமாக உங்கள் சோர்வு அல்லது தூக்கம் எவ்வளவு கடுமையாக இருந்தது.

- ☐ மிகவும் கடுமையானது (4)
- ☐ கடுமையான(3)
- ☐ மிதமான(2)
- ☐ லேசான(1)
- ☐ எதுவும்இல்லை(0)

6. உங்கள் அமைதியற்ற கால்கள் நோய்க்குறி ஒட்டுமொத்தமாக எவ்வளவு கடுமையாக இருந்தது

- ☐ மிகவும்கடுமையானது(4)
- ☐ கடுமையான(3)
- ☐ மிதமான(2)
- ☐ லேசான(1)
- ☐ எதுவும்இல்லை(0)

7. அடிக்கடி அமைதியற்ற கால்கள் நோய்க்குறி அறிகுறிகள் உங்களிடம் உள்ளதா?

- ☐ மிகவும் அடிக்கடி -6 முதல் 7 நாட்கள் வரை(4)
- ☐ பெரும்பாலும்-4 முதல் 5 நாட்கள்(3)
- ☐ சில நேரங்களில்-2 முதல் 3 நாட்கள்(2)
- ☐ எப்போதாவது ஒரு நாள் அல்லது குறைவாக(1)
- ☐ ஒருபோதும் இல்லை(0)

8. உங்களுக்கு அமைதியற்ற கால்கள் நோய்க்குறி அறிகுறிகள் இருந்தால், சராசரியாக ஒரு நாளில் எவ்வளவு கடுமையாக இருக்கும்?

- ☐ மிகவும் கடுமையானது; 24 மணி நேரத்திற்கு 8 மணிநேரத்திற்கு குறைந்தது(4)
- ☐ கடுமையான; 24 மணி நேரத்திற்கு 3 முதல் 8 மணி நேரம்(3)
- ☐ மிதமான; 24 மணி நேரத்திற்கு 1 முதல் 3 மணி நேரம்(2)
- ☐ லேசான; 24 மணி நேரத்திற்கு ஒரு மணி நேரத்திற்கு குறைவாக(1)
- ☐ எதுவும்இல்லை(0)

9. உங்கள் தினசரி விவகாரங்களை முன்னெடுப்பதற்கான உங்கள்திறனை உங்கள் நோய்களின் அறிகுறிகளின் தாக்கம் எவ்வளவு கடுமையாக இருந்தது (உதாரணமாகஒருதிருப்திகரமானகுடும்பம், வீடு, சமூகம், பள்ளி, அல்லதுவேலைவாழ்க்கைஆகியவற்றைகையாளமுடிகிறதா)?

- ☐ மிகவும்கடுமையானது(4)
- ☐ கடுமையான(3)
- ☐ மிதமான(2)
- ☐ லேசான(1)
- ☐ எதுவும்இல்லை(0)

10. உங்கள் அமைதியற்ற கால்கள் நோய்க்குறி அறிகுறிகளின் காரணமாக உங்கள் மனநிலை பாதிப்பு எவ்வளவு கடுமையாக இருந்தது (உதாரணமாக, கோபம், மனச்சோர்வு, சோகம், ஆர்வம், அல்லதுஎரிச்சல்)

- ☐ மிகவும்கடுமையானது(4)
- ☐ கடுமையான(3)
- ☐ மிதமான(2)
- ☐ லேசான(1)
- ☐ எதுவும்இல்லை(0)

gphpT - <

Nrhh;tpid fz;lwpAk; Nfs;tpfs;

t.vz;	Nfs;tpfs;	xU NghJk; ,y;iy	rpy Neuq;fspy;	tof;fkhf	mbf;fb	vg;nghOJk;
1	vd; Nrhh;tpid Fwpj;J tUe;JfpNwd;.					
2	ehd; rPf;fpukhf Nrhh;tilfpNwd;.					
3	ehd; gfy; Neuj;jpy; mjpfkhf Ntiy nra;tjpy;iy.					
4	vdJ jpdrhp tho;tpy; NghJkhaemodialysis Mw;wy; fhzg;gLfpwJ.					
5	cly; hPjpahf> fisg;gile;jjhf czh;fpNwd;.					
6	ehd; ve;j nray;fisAk; njhlq;Ftjpy; rpukg;gLfpNwd;.					
7	ehd;; rhpahf Nahrpg;gjpy; rpukg;gLfpNwd;.					
8	ehd;; ve;j nraiy nra;tjw;Fk; tpUg;gkw;wpUf;fpNwd;.					
9	kdhPjpahf>fisg;gile;jjhf czh;fpNwd;.					
10	ehd;; ve;j fhhpak; nra;jhYk; vd;dhy; rpwg;ghf ftdk; nrYj;j KbfpwJ.					

PHOTOS - H